FLORA OF PERU

BY

DONOVAN S. CORRELL

HEAD, BOTANICAL LABORATORY,

TEXAS RESEARCH FOUNDATION

BOTANICAL SERIES

FIELD MUSEUM OF NATURAL HISTORY

VOLUME XIII, PART V-B, NUMBER 2

JANUARY 18, 1967

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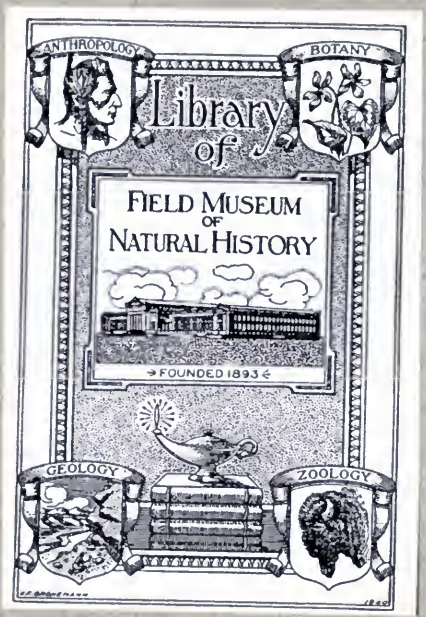
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FLORA OF PERU

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SOLANACEAE (Juss.) Lindl.

KEY TO SECTION NEOLYCOPERSICON AND SECTION TUBERARIUM[1]

Flowers slightly zygomorphic (irregular); pedicels subtended by floral bracts.....I. Section *Neolycopersicon.*

Flowers actinomorphic (regular); pedicels naked, not subtended by floral bracts.....II. Section *Tuberarium.*

I. Section NEOLYCOPERSICON Correll

The Potato and its Wild Relatives 39. 1962.

Plants herbaceous, with fibrous roots and brittle stems; leaves odd-pinnate; flowers bright yellow, slightly zygomorphic; pedicels subtended by floral bracts, articulate above the middle; anthers loosely coherent, curved, with two large apical pores, without sterile appendages; pistil recurved above the middle; fruits globular.

Plant densely glandular-pubescent throughout; leaflets coarsely crenate or crenate-dentate.....*S. Pennellii.*

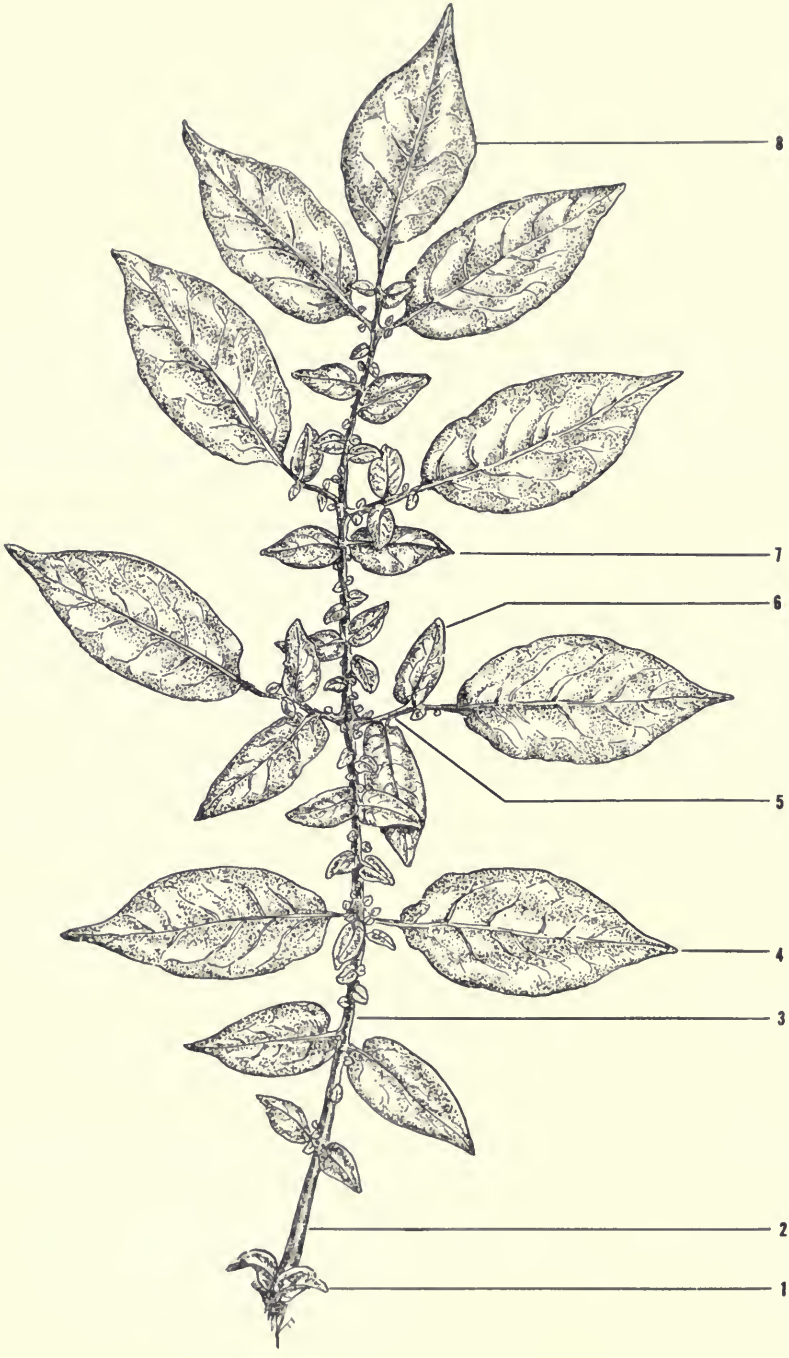
Plant merely puberulent or with few scattered hairs; leaflets entire or only slightly and distantly crenate-dentate.
S. Pennellii var. *puberulum.*

Solanum Pennellii Corr., Madroño 14: 233, Fig. 1 (B). 1958; Wrightia 2: 23–24, Fig. 5. 1959. *Figure 2.*

Open rocky slopes and in sandy-rocky soil from near sea level up to 1,000 m. alt. Rare in Peru.

Plant woody-herbaceous, erect, 5 dm. or more tall, glandular-pubescent throughout (sticky to the touch), rootstock with fibrous roots, non-tuber-bearing; stem woody; leaves odd-pinnate, up to 13 cm. long, with few interstitial leaflets; leaflets 5 or 7, prominently petiolulate, suborbicular, coarsely crenate or crenate-dentate, truncate to cordate at base, up to 4 cm. in diameter; petiolules up to 1 cm. long; pseudostipular leaves shaped similarly to the leaflets but

[1] See page 157 of Vol. 13, Parts 5-B, No. 1. 1962. Drawings by Vivien Frazier.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somewhat reniform, 1–2 cm. long; inflorescence terminal or terminating the lateral branches, corymbose or racemose, few- to many-flowered; peduncle slender, up to 8 cm. long, provided with one or more semiorbicular bracts that sometimes continue into the inflorescence; pedicels slender, up to 2 cm. long, articulate well below the middle or near the base; flowers lemon-chrome; calyx 5–6 mm. long, divided to near the base into oblong-elliptic obtuse lobes; corolla rotate-stellate, up to 3.5 cm. in diameter, the lobes broadly ovate and acute to subobtuse; anthers of two lengths, linear-oblong in outline, the largest up to 10 mm. long, the smaller up to 7 mm. long, strongly recurved above the middle, opening by two pores at the apex that soon become slit to the base of the anthers; filaments rather thick, pubescent, up to 2 mm. long; style up to 11 mm. long, strongly curved near the apex, adorned with long silky hairs for most of its length; stigma elongate and prominent; fruits subglobose, compressed or oblate, glandular-puberulent (sticky to the touch), 1.5–2 cm. in diameter.

Arequipa: along Panamerican Highway between Chala and Atico, near sea level, *Correll & Smith P173.*—La Libertad: Prov. Trujillo, El Portachuelo, Ascope–San Benito, *Lopez M. 1273.*—Lima: Chosica, near Tiro al Blanco, sandy soil, *Ferreyra 6107.* Quive, open rocky slope, *Pennell 14304.* Vicinity of Sicacayo, Lurin Valley, in low places 72–73 km. from Lima, *Smith s.n.*—Indefinite: *Weberbauer 5315.*

Solanum Pennellii var. **puberulum** Corr., Wrightia 2: 197. 1961. *Figure 3.*

If the basic design and habit of the plant and flowers did not follow so closely that of typical *S. Pennellii* the var. *puberulum* might readily be separated as a distinct species. Outwardly, it differs rather markedly from typical material, and at first I considered it to be a distinct species to the extent of having an illustration prepared. As its name implies, the plant is puberulous instead of being densely glandular-pubescent. The leaflets also have entire to subentire rather than crenate or coarsely dentate margins. This plant apparently represents an extreme condition in this rather highly variable species.

Ica: Nazca Prov., sandy-rocky soil in dry river-bed between Nazca and Palpa, *Ferreyra 14028.*

FIG. 1. *Solanum Wittmackii* Bitt. Odd-pinnate leaf to demonstrate segmentation, × ½: 1, pseudostipular leaf; 2, petiole; 3, rachis; 4, lateral leaflet; 5, petiolule; 6, secondary leaflet; 7, interstitial leaflet; 8, terminal leaflet.

FIG. 2. *Solanum Pennellii* Corr. 1, upper flowering branch, × ½; 2, leaf from lower part of plant, × ½; 3, inflorescence, × 1; 4, calyx, spread out, × 2; 5, corolla, spread out, × 1½; 6, stamens and pistil, spread out, × 2; 7, apical portion of anther, ventral view (note large pores), × 10; 8, fruit, × ½.

FIG. 3. *Solanum Pennellii* var. *puberulum* Corr. 1, upper part of flowering plant, × ½; 2, leaf from lower part of plant, × ½; 3, calyx, spread out, × 1½; 4, corolla, spread out, × 1½; 5, stamen, dorsal view, × 3; 6, stamen, ventral view, × 3; 7, pistil, × 3.

II. Section **TUBERARIUM** (Dunal) Bitt.

Repert. Sp. Nov. 10: 531, 532. 1912; 11: 255. 1912. *Tuberarium* Dunal in DC., Prodr. 13 (1): 28. 1852, as Subsection.

Plants unarmed, commonly tuber-bearing. Leaves usually odd-pinnate, sometimes simple and entire or rarely pinnatifid. Pedicels always articulate (jointed) either at the base or just below the calyx or anywhere between these two points.

A. Subsection **BASARTHRUM** Bitt.

Repert. Sp. Nov. 11: 350. 1912.

Pedicels articulate at the base or essentially so; hairs acute, usually merely 2-celled, the basal cell provided with a thicker wall and longer, the apical cell shorter with a thinner wall (bayonet-hairs); plants perennial herbs, vines or viny shrubs, non-tuber-bearing.

Corolla rotate or sometimes rotate-substellate.

Plants cultivated for their large edible fruits or ruderal; corolla usually 2.5 cm. or more in diameter.....1. Series *Muricata.*

Plants not cultivated for their fruits; corolla rarely up to 2.5 cm. in diameter.

Filaments more or less united above their attachment to the corolla; leaves simple or rarely composed of as many as 5 leaflets with the lowermost pair of lateral leaflets greatly reduced in size.....2. Series *Caripensa.*

Filaments not united; leaflets always 5 or more, the lowermost pair of leaflets only slightly reduced in size.
4. Series *Suaveolentia.*

Corolla stellate, usually deeply so.

Plant a viny bush; stem not rooting at nodes; filaments always more or less united above their attachment to the corolla; flowers often showy.....2. Series *Caripensa.*

Plant a climbing or sprawling vine; stem usually rooting at the nodes; filaments may or may not be united; flowers inconspicuous.....3. Series *Appendiculata.*

B. Subsection **HYPERBASARTHRUM** Bitt.

Repert. Sp. Nov. 11: 359. 1912.

Pedicels articulate above the base, often articulate at about the middle or rarely only a little below the calyx or at or near the base;

hairs usually many-celled, the basal cell not provided with a thickened membrane or wall and not several times longer than the upper cells; plants perennial herbs, rarely suffrutescent, usually tuber-bearing.

Plant an erect or viny shrub or high-climbing vine; flowers usually deep yellow.....5. Series *Juglandifolia.*

Plant herbaceous or rarely slightly woody; flowers not deep yellow but sometimes yellowish white.

Leaves simple, oblanceolate, the blade sessile or essentially so; fruits globose.....11. Series *Megistacroloba.*

Leaves (at least some) odd-pinnate.

Plant densely glandular, usually with a peculiar aroma; distribution in loma vegetation zone of coastal Peru.
10. Series *Vaviloviana.*

Plant glabrous to pubescent, at most only very sparsely glandular, without a distinctive or peculiar odor; distribution in mountains (except *S. chancayense*).

Leaf-rachis prominently winged or with most of the lateral leaflets strongly decurrent on the leaf-rachis.

Terminal leaflet much larger than the individual lateral leaflets.....11. Series *Megistacroloba.*

Terminal leaflet not noticeably larger than the lateral leaflets.....6. Series *Ingaefolia.*

Leaf-rachis not prominently winged, rarely very narrowly winged; the uppermost pair of lateral leaflets sometimes decurrent on the leaf-rachis, the lower pairs of lateral leaflets usually only sessile or petiolulate.

Plant prostrate on ground or forming rosettes; lateral leaflets auriculate on the acroscopic side; pedicels seemingly inarticulate or with a ring just below the calyx.
12. Series *Acaulia.*

Plant without the above combination of characteristics.

Fruit ellipsoid-conical.....8. Series *Conicibaccata.*

Fruit globose or ovoid at most, not conical.

Leaves usually thick or subcoriaceous; leaflets glossy (vernicose) and mostly glabrous on upper surface, frequently with short often harsh hairs increasing in number toward the typically revolute margin, the margin often marginate.....7. Series *Piurae.*

Leaves not as above.
Leaves with a 3-leaflet aspect; terminal leaflet much larger than the adjacent pair of lateral leaflets; leaf-rachis and petiole with numerous small subimbricated interstitial leaflets.
9. Series *Minutifoliola*.
Leaves not as above.
Distribution confined to mountainous regions except for the coastal species *S. chancayense*.
13. Series *Transaequatorialia*.
Distribution central and southern Peru, coastal or (if montane) very coarsely pubescent (especially the calyx) and with the upper pair of lateral leaflets more or less decurrent on the leaf-rachis.....14. Series *Tuberosa*.

Series 1. MURICATA

Muricata Corr., Sect. Tuberarium of Genus Solanum of N. Amer. and Centr. Amer. (Agr. Monogr. No. 11, U. S. Dept. Agr.) 49. 1952.

Plants from woody rootstocks, bushy, much-branched or rarely simple, non-tuber-bearing; leaves simple or odd-pinnate, with the petiole articulate at base; pedicels articulate at base; corolla rotate-pentagonal to broadly rotate-substellate; fruits ovoid to ellipsoid, edible.

Cultivated in temperate and cool regions throughout Latin America.

Leaves entire.
Plants appressed-strigose.....*S. muricatum*.
Plants glabrous.....*S. muricatum* f. *glaberrimum*.
Leaves (at least some) odd-pinnate....*S. muricatum* var. *protogenum*.

Solanum muricatum Ait., Hort. Kew. 1: 250. 1789. Type locality: native of Peru; Bitt., Repert. Sp. Nov. 11: 358. 1912: Corr., Sect. Tuberarium of Genus Solanum of N. Amer. and Centr. Amer. (Agr. Monogr. No. 11, U. S. Dept. Agr.) 51, Figs. 30–33. 1952. *S. variegatum* R. & P., Fl. Peruv. & Chil. 2: 32, T. 162a. 1799. *Figure 4*.

Cultivated in temperate and cool regions throughout Latin America for its edible fruit, occasionally found along streams and on hillsides of warm mountain valleys, 1,000–2,700 m. alt.

FIG. 4. *Solanum muricatum* f. *glaberrimum* Corr. 1, upper part of flowering plant, × ½. *Solanum muricatum* Ait. 2, calyx, spread out, about × 1½; 3, corolla, spread out, about × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3; 6, fruit, × ½.

Plant an erect or ascending herb or shrub with woody base and fibrous roots, up to 1 m. or more tall, appressed-strigose throughout or rarely entirely glabrous (cf. f. *glaberrimum*); stem branched or sometimes simple; leaves usually long-petiolate, simple or with one or two pairs of lateral leaflets (cf. var. *protogenum*), without interstitial leaflets; blades of leaves or leaflets ovate-lanceolate to elliptic-lanceolate or oblong-lanceolate, rounded or rather abruptly contracted into the petiole at the oblique base, obtuse to tapering and acute to acuminate at the apex, up to 15 cm. long and 4.5 cm. wide; petiole 3–7 cm. long, articulate at base; inflorescences pseudoterminal on leafy branches, few- to many-flowered (as many as 12); peduncle forked once just below the flowers or sometimes simple, 5–8 cm. long; pedicels 5–15 mm. long, increasing noticeably in length and thickness in the fruiting stage, articulate at or near the base; flowers violet-purple or white marked with purple; calyx 4–7 mm. long, divided to about or below the middle into irregular unequal lanceolate acuminate lobes; corolla rotate-pentagonal to broadly rotate-substellate, up to 4 cm. in diameter, with the lobes broadly rounded above and apiculate at the apex, strigose on the outer surface; anthers linear to linear-lanceolate in outline, 4.5–6 mm. long; filaments about 1.5 mm. long, glabrous; style 5–9 mm. long, slightly exceeding the stamens, commonly papillose; stigma clavellate, somewhat bifid; fruit ovoid to ellipsoid, white or pale green and purple-variegated, pendent, edible, the flesh yellow, up to about 10 cm. long and 6 cm. in diameter.

Solanum muricatum is believed to be a native of the Andean region, but is probably known only in cultivation or as an escape from cultivation. Fruits of the cultivated plants are usually seedless. The green fruits are cooked and eaten, the ripe ones eaten raw. This species is known by a number of vernacular names, of which some of the common ones are "pepino," "pepino blanco," and "pepino dulce."

Lima: Prov. Huarochirí, along small stream on hillsides above Sta. Eulalia, 1,250 m. alt., *Goodspeed 33100*. Lima, cultivated, *Soukup 3560*. Lima, *Ruíz & Pavon 8/64 (88)*. Lima, *Ruíz & Pavon s.n.* —Indefinite: Tambotal, Chucarapi, cultivated, *Guenther & Buchtien 592*, received Dec. 27, 1878, *Martinet 989*. *Pavon 374*.

Solanum muricatum f. **glaberrimum** Corr., Wrightia 2: 178. 1961.

This plant is entirely glabrous throughout in contrast to the appressed-strigose condition of all other plants that make up this species.

Lima: Río Pativilca Valley, Hacienda Paramonga, *Seibert 2176*.

Solanum muricatum var. **protogenum** Bitt., Repert. Sp. Nov. 12: 442. 1913. *S. hebephorum* H. & B. ex Dun., Solan. Syn. 7. 1816. Type locality: Peru, near Cajamarca.

All those plants that have all or some of their leaves odd-pinnate are placed in the var. *protogenum*. Other than this tendency to develop lateral leaflets, I can find no other difference in these plants to contrast it with the simple entire-leaved typical *S. muricatum*.

Cajamarca: near Cajamarca, *Humboldt & Bonpland s.n.*

Series 2. CARIPENSA

Caripensa Corr., The Potato and its Wild Relatives 50. 1962.

Woody or somewhat herbaceous vines or viny shrubs with fibrous roots and non-tuber-bearing; leaves simple or with one or sometimes two reduced lateral leaflets; petiole articulate at or near the base; pedicels articulate at the base; corolla rotate to rotate-substellate or rarely stellate; filaments more or less united above their attachment to the corolla; fruits subglobose to ovoid.

The species in this series differ from the closely related *S. muricatum* primarily in their small fruits and more or less united filaments.

From Costa Rica to Peru.

Inflorescence many-flowered, commonly cymose-paniculate; calyx-lobes triangular-ovate, not noticeably constricted or ligulate.

Leaf or leaflets acute to acuminate at apex.....*S. basendopogon.*

Leaf or leaflets rounded to obtuse at apex.

S. basendopogon f. *obtusum.*

Inflorescence few-flowered, mostly racemose.

Leaves always simple, with a truncate to subcordate base; calyx-lobes ligulate.....*S. filiforme.*

Leaves usually with some odd-pinnate; calyx-lobes more or less constricted, not ligulate.

Corolla rotate to rotate-stellate.....*S. caripense.*

Corolla conspicuously stellate.....*S. caripense* var. *stellatum.*

Solanum basendopogon Bitt., Repert. Sp. Nov. 12: 1. 1913. *Figure 5.*

Among shrubs on rocky hills and about old stone fences, up to 3,300 m. alt. Known only from Arequipa and Lima departments, Peru.

Plant a small shrub or viny shrub, up to at least 3 m. tall, more or less densely strigose throughout with short appressed or porrect-incurved whitish or tawny hairs; stem slender, strong, branched; leaves simple or trifoliate, with a petiole up to 2.5 cm. long which is conspicuously articulate at base and readily deciduous, with straight or crinkly hairs on lower surface, strigose on upper surface; terminal leaflet or simple leaf suborbiculate-ovate to ovate-elliptic or lanceolate to elliptic-lanceolate, bluntly rounded (in f. *obtusum*) to acute or shortly acuminate at apex, broadly rounded to cuneate at base, up to 8 cm. long and 3.5 cm. wide; lateral leaflets (when present) similar to the terminal leaflet but greatly reduced; pseudostipular leaves broadly lunate, up to 1 cm. long; inflorescence pseudoterminal, up to 50-flowered, cymosely paniculate; peduncle up to 8 cm. long, several branched above, the branches spreading and mostly slender, often provided with a solitary bract below the middle and a bract or bracts in axil of first fork; pedicels about 8 mm. long, articulate at base; flowers light purple to lavender; calyx 2–4 mm. long, divided to about the middle into short triangular-ovate obtuse to subacute lobes; corolla rotate-pentagonal to rotate-substellate, 1.5–2.5 cm. in diameter, sometimes with a central row of sharp glistening hairs on the inner surface of each petal; anthers oblong-elliptic in outline, 2.5–3.5 mm. long, cellular-pilose on ventral surface and at base; filaments less than 1 mm. long, pilose; style 5–6 mm. long, usually strongly bent near apex, minutely cellular-papillose below middle, the stigma slightly thickened; fruit globose to ovoid, deep green at base, light green and often white-spotted above, 1.5–2 cm. in diameter.

The type specimen of *S. basendopogon* has elliptic-lanceolate, shortly acuminate, entire leaves, while the rest of the material that is cited here as f. *obtusum* has typically ovate-elliptic, broadly obtuse leaves and in some collections a pair of small lateral leaflets is developed.

This species differs from *S. caripense* mainly in its slender, usually several-branched, inflorescence and the short, differently lobed calyx.

Arequipa: Cerro prieto, Chala alta, small shrub 2 to 3 m. tall, *Martinet 374*.

Solanum basendopogon f. **obtusum** Corr., Wrightia 2: 170. 1961. *Figure 5.*

Although I have considered this plant to be a geographic variety, it is quite possible that this is too conservative a treatment. However, until more material becomes available, especially between the

FIG. 5. *Solanum basendopogon* Bitt. 1, flowering branch, × ½; 2, calyx, spread out, × 3; 3, corolla, spread out, × 1½; 4, three stamens to show united filaments, dorsal view, × 3; 5, pistil, × 3. *Solanum basendopogon* f. *obtusum* Corr. 6, branch of flowering plant, × ½.

departments Arequipa and Lima, Peru, I believe it best to treat these plants as I have done.

The more common f. *obtusum* differs from typical *S. basendopogon* in having its leaves or primary leaflets ovate-elliptic and broadly obtuse instead of elliptic-lanceolate and shortly acuminate. In some plants a pair of lateral leaflets is sometimes developed on the leaves. Forma *obtusum* is also a stouter and more heavily pubescent plant. The paniculate inflorescence and floral characteristics, however, appear to be essentially similar in both.

Lima: on slopes above Canta, 2,850 m. alt., *Correll, Smith & Ferreyra P284*. Growing among bushes above Canta, 2,900 m. alt., *Correll, Smith & Ferreyra P299*. Above Surco, *Ferreyra 3438*. Prov. Huarochirí, above Surco, rocky place on brow of hill, 2,600–2700 m. alt., *Ferreyra 6065*. Prov. Huarochirí, above Surco, 2,600–2,700 m. alt., *Ferreyra 6068*. Prov. Huarochirí, Picoy, above Surco, 3,200–3,300 m. alt., *Ferreyra 6092*. Matucana, at base of old stone fence, 2,450 m. alt., *MacBride & Featherstone 390*. Matucana, *Martinet s.n.* Hills of Purruchuca, *Mathews 526*. Indefinite: Canruru, *Savatier s.n.*

Solanum caripense H. & B. ex Dun., Solan. Syn. 8. 1816; H.B.K., Nov. Gen. et Sp. 3: 22. 1818. *S. chiliadenium* Bitt., Repert. Sp. Nov. 16: 408. 1920. *Figure 6.*

In and on the edge of thickets, on wooded slopes and along streams, about the base of cliffs or sometimes on open slopes, 800–3,800 m. alt. Costa Rica, Venezuela, Colombia, Ecuador and Peru.

Plant a viny bush, climbing or sprawling, up to 2 m. or more tall (or long), more or less densely pilose throughout with dull tawny or shiny silvery hairs; stem woody or thick-herbaceous, hirsute; leaves entire to trilobed or with a second pair of greatly reduced lateral leaflets, rarely more than 12 cm. long, with a petiole up to 5.5 cm. long; leaf or leaflets ovate to ovate-elliptic or elliptic-lanceolate to lanceolate, cuneate to broadly rounded or cordate at base, broadly obtuse to shortly acuminate at apex, densely hirsute; lateral leaflets sessile to very shortly petiolulate, mostly asymmetrical and sometimes basiscopically subauriculate at base; terminal leaflet usually noticeably larger than the lateral ones, up to 10 cm. long and 5 cm. wide, usually much smaller; pseudostipular leaves broadly reniform, lunate, up to about 2 cm. long; inflorescence pseudoterminal and/or lateral, a few- (up to about 10) flowered simple raceme or very rarely paniculate; peduncle naked or subtended by a pair of bracts at or near the base,

FIG. 6. *Solanum caripense* H. & B. 1, branch of plant in bud, × ½; 2, flower bud with corolla removed, × ½; 3, inner surface of young corolla, showing attached stamens, × ½; 4, outer surface of young corolla, × ½; 5, calyx, spread out, × 1½; 6, corolla, spread out, × 1½; 7, stamens, dorsal view, note united filaments, × 3; 8, pistil, × 3; 9, calyx, spread out, × 1½; 10, corolla, spread out, × 1½; 11, two stamens, dorsal view, note united filaments, × 3; 12, pistil, × 3; 13, branch of flowering plant, × ½; 14, two fruits, × ½.

up to 8 cm. long, simple or sometimes once- or twice-forked above; pedicels slender or stout, about 1 cm. long, articulate at or near the base, hispid-pubescent and frequently glandular; flowers commonly purple to lavender or somewhat bluish tinged, occasionally white or whitish and marked with purple or lavender; calyx dark green, usually densely pilose, 4–6 mm. long, rarely longer, divided to about the middle into lanceolate or broadly rounded and abruptly acuminate to acute lobes; corolla rotate-pentagonal to rotate-stellate or stellate (in var. *stellatum*), 1.3–2.3 cm. in diameter; anthers elliptic in outline, 3–4 mm. long, rarely dorsally pilose along the center; filaments usually united about midway or more above their attachment to the corolla, hirsute; style 6–7 mm. long, more or less papillose, the stigma only slightly enlarged; fruit globose to ovoid or ovoid-ellipsoid, green with darker green or purplish stripes, up to 3 cm. in diameter.

Although the pubescence of most specimens of *S. caripense* is characteristically tawny and dull, some plants are found that have dense silvery brilliant hairs. The pubescence varies with almost every plant or, at least, collection. On the stem, leaf-rachises, peduncle and petioles the hairs are irregularly wide-spreading; that is, they grow at right angles to these organs and are sometimes even directed downward or spreading erratically.

Typical *S. caripense* predominantly has a 3-leaflet aspect, but a second pair of greatly reduced lateral leaflets may be present or the leaf may be simple and undivided. The corolla is rotate-pentagonal to somewhat rotate-substellate or even stellate (in var. *stellatum*).

Amazonas: Chachapoyas, *Mathews 1511*. Chachapoyas, *Mathews 3246*.—Ancash: in thicket, 11 km. from Huaráz on road to Yungay, about 3,000 m. alt., *Correll & Smith P953*. Baños de Chancos (Huaráz), in semishade, 2,600 m. alt., *Sandeman 4624*. Prov. Huarás, Marcará, 3,000 m. alt., *Velarde Nuñez 3237*.—Apurímac: Abancay, 2,400 m. alt., *Vargas C. 753*.—Ayacucho: Ccarrapa, between Huanta and Río Apurímac, wooded hillside, 2,200 m. alt., *Killip & Smith 23209*.—Cajamarca: on brushy slope, 27 km. from Cajamarca on road to Chilete, 2,700 m. alt., *Correll & Smith P853*. In thicket along stream about 4 km. south of Namora, 2,500 m. alt., *Correll & Smith P900*. Prov. Hualgayoc, Monte Seco, 1,800 m. alt., *Soukup 3901*. Prov. Cutervo, Sucse River Valley, west of Socotá, in shrubland pasture, 2,800 m. alt., *Stork & Horton 10104*.—Cuzco: Prov. Paucartambo, among shrubs on steep slopes, 3,500 m. alt., *Balls & Hawkes 6672*. Above Limatambo, 3,800 m. alt., *Blood & Tremelling 193*. Pisac, sandy soil on edge of corn field, 3,500 m. alt., *Cárdenas*

FIG. 7. *Solanum caripense* var. *stellatum* Corr. 1, branch of flowering plant, × ½; 2, fruiting inflorescence, × ½; 3, calyx, spread out, × 1½; 4, corolla, spread out, × 1½; 5, stamen, dorsal view, × 3; 6, pistil, × 3.

2304. Ollantaytambo, 3,000 m. alt., *Cook & Gilbert 285 & 403*. Rocky slopes 5 km. from Pisac on road to Cuzco, 3,200 m. alt., *Correll, Smith & Vargas P226*. Prov. Convención, Hacienda Potreto, among shrubs, 1,350 m. alt., *Vargas 1749*. Vilcabamba, Prov. Calca, *Vargas 3910*. Prov. Paruro, Collcha, in rocky places and on cliffs, left of the Apurímac River, 2,800 m. alt., *Vargas 9739*.—Huancavelica: among shrubs on brow of argillaceous hills, Checcyancu, 4 km. east of Conaica, 3,300–3,350 m. alt., *Tovar 183*.—Junín: on open brushy slope along small stream in valley just below Palca, 2,800 m. alt., *Correll & Smith P764*. Mito, supported in stream-canyon jungle, 2,740 m. alt., *MacBride 3427*. Prov. Jauja, 5 km. from Comas, 3,250 m. alt., *Ochoa 537*. Top of the mountain, near Carpapata below San Ramón, Tarma, 2,200 m. alt., *Ochoa 624*. Prov. Tarma, Carpapata, below San Ramón, 2,200 m. alt., *Ochoa 2017*. Huancayo, 3,317 m. alt., *Soukup 2022*. Prov. Tarma, between Palca and Carpapata, leaning on shrubs, 2,900 m. alt., *Stork 10974*.—La Libertad: along brushy stream about 3 km. west of Huamachuco, 3,200 m. alt., *Correll & Smith P931*.—Lambayeque: on bank among bushes, 42 km. from Olmos on road to Jaen, 2,000 m. alt., *Correll & Smith P814*. Rocky thicket, San Buenaventura, *Pennell 14561*.

Solanum caripense var. **stellatum** Corr., Wrightia 2: 170. 1961. *Figure 7*.

Vegetatively, this plant is indistinguishable from what we consider to be "typical" *S. caripense*. The stellate corolla, however, readily sets it apart from the essentially rotate corolla of typical *S. caripense*.

Junín: Prov. Tarma, Utcuyacu, on waste land, 1,800 m. alt., *Woytkowski 35386*.

Solanum filiforme R. & P., Fl. Peruv. & Chil. 2: 31, Tab. 159, fig. b. 1799; Bitt., Repert. Sp. Nov. 13: 102. 1914. *S. apalophyllum* Dun. in DC., Prodr. 13(1): 42. 1852. *Figure 8*.

Plant shrubby, much-branched; oldest branches about 3.5 mm. thick, sparingly tawny pilose; youngest branches floriferous, terete, about 1.5 mm. thick, densely pilose with erect-spreading yellowish sharp hairs; leaves simple and entire, ovate to broadly ovate-elliptic, rounded to obtuse at apex, truncate to somewhat cordate at base, strigose on both surfaces, up to 7 cm. long and 4 cm. wide, with a petiole up to 2.5 cm. long; pseudostipular leaves about 1 cm. long, elliptic, essentially symmetrical; inflorescence pseudoterminal on the

FIG. 8. *Solanum filiforme* R. & P. 1, branch of flowering plant (in bud), ×½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamens, dorsal view, note united filaments, × 3; 5, pistil, × 3.

young branches, few- (up to 9) flowered; peduncle usually less than 2 cm. long, densely pilose with tawny hairs; pedicels about 1 cm. long, articulate at base, densely pilose with tawny hairs; flowers apparently lavender-purple; calyx 4–7 mm. long, divided to about or below the middle into ligulate obtuse lobes, the sinus broad and U-shaped between the lobes, densely pilose with tawny hairs; corolla rotate-pentagonal, 1.5–2.5 cm. in diameter, densely tawny pilose on the outer surface; anthers elliptic in outline, 4–4.5 mm. long, with a dorsal excrescence at the base; filaments united to form a crown, glabrous; style about 7 mm. long, minutely cellular-papillose below the middle, the stigma only slightly thickened; fruit unknown.

Indefinite: 1778–1788, *Pavon s.n.*—1778–1788, *Ruiz & Pavon s.n.*—1778–1788, *Ruiz & Pavon 8/57.*

Series 3. APPENDICULATA

Appendiculata Rydb., Bull. Torrey Bot. Club 51: 146, 174. 1924.

Woody vines that usually root at the nodes, trail on the ground, adhere to the bark of trees or climb high into trees, non-tuber-bearing; leaves odd-pinnate or sometimes with some or most simple, without interstitial leaflets; petiole commonly articulate at base; pedicels articulate at or near the base; corolla usually small and whitish, stellate; fruits globular to ovoid or ellipsoid, often reddish when ripe.

Solanum brevifolium H. & B. ex Dun., Solan. Syn. 22. 1816. *Figure 9.*

Climbing on trees or sprawling on floor of forests and in thickets, 2,700–3,400 m. alt. Ecuador and Peru.

Plant mostly with a flattened habit, climbing and clinging to trees and shrubs, subglabrous to sparsely pilose; stem slender, wiry, rooting at the nodes, much-branched; leaves simple or with one or two lateral leaflets, dark green and glossy, thick-herbaceous to coriaceous, rarely more than 5 cm. long, with a petiole mostly less than 1 cm. long which is articulate at the base; terminal leaflet or simple leaf broadly or narrowly elliptic to oblong-elliptic or sometimes suborbicular, rounded to truncate or subcordate at the oblique base, obtuse at apex, up to 4 cm. long and 2 cm. wide, usually much smaller; lateral leaflets greatly reduced; pseudostipular leaves obliquely elliptic, up to 8 mm. long; inflorescences composed of several flowers that are clustered at the apex of twigs and branchlets; peduncle apparently lacking; pedicels up to 2.5 cm. long, usually much shorter, articulate

FIG. 9. *Solanum brevifolium* H. & B. 1, flowering and sterile branch, × ½; 2, calyx (spread out) and upper part of pedicel, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3; 6, two fruits, × ½.

at the base; flowers white, occasionally purple-tinged; calyx 3–4 mm. long, divided to about the middle into ovate-triangular acute marginate lobes, commonly bilabiate; corolla stellate, divided to near the base into elliptic subacute to obtuse lobes that are 8–10 mm. long and thicker at the apex; anthers elliptic in outline, 3.5–4 mm. long; filaments slender, essentially terete, glabrous, 1–1.5 mm. long; style about 8 mm. long, glabrous; fruits unknown.

The type collection, which was in the Berlin Herbarium, is attributed to Peru. I have, however, seen no other specimen from our region. The species seems to be indigenous to south-central Ecuador.

Solanum brevifolium, if it belongs at all in section Tuberarium, is apparently one of the farthest removed from the tuber-bearing species. It is included in this section for the first time, primarily on the basis of its apparent relationship to other species that have traditionally been maintained in the series Appendiculata.

Peru.—Indefinite: "almaguev," *A. von Humboldt 2201*.

Series 4. SUAVEOLENTIA

Suaveolentia Rydb., Bull. Torrey Bot. Club 51: 146, 173. 1924.

Herbaceous or somewhat woody lax or stout vines or viny shrubs with fibrous roots, apparently non-tuber-bearing; leaves odd-pinnate, with or without interstitial leaflets; pedicels articulate at or near the base; corolla rotate-pentagonal; fruits globular to ovoid.

From northern Mexico to the Yungas region of Bolivia.

Solanum suaveolens Kunth & Bouché, Ind. Sem. Hort. Berol. 1848: 14. 1848; Bitt., Repert. Sp. Nov. 11: 351. 1912; Corr., Sect. Tuberarium of Genus Solanum of N. Amer. and Centr. Amer. (Agr. Monogr. No. 11, U. S. Dept. Agr.) 44, Figs. 26–27. 1952. *S. Endlicheri* Dun. in DC., Prodr. 13(1): 67. 1852. *S. tarapotense* Van Heurck & Muell. Arg. in Heurck, Obs. Bot. 38. 1870–71. *Figure 10*.

In thickets and forested areas, on open grassy-rocky slopes, about the base of cliffs and along streams of valleys and canyons, and in hedgerows of cultivated areas, from near sea level up to 2,300 m. alt., usually below 1,000 m. on lower mountain slopes and valleys from San Luis Potosí State, Mexico, southward through Guatemala, British Honduras, Costa Rica, Venezuela, Colombia, Ecuador and Peru to the Yungas region of Bolivia.

Plant lax, straggly, up to 9.5 dm. or more tall, usually about 4 dm., more or less strigose throughout with appressed hairs; stem

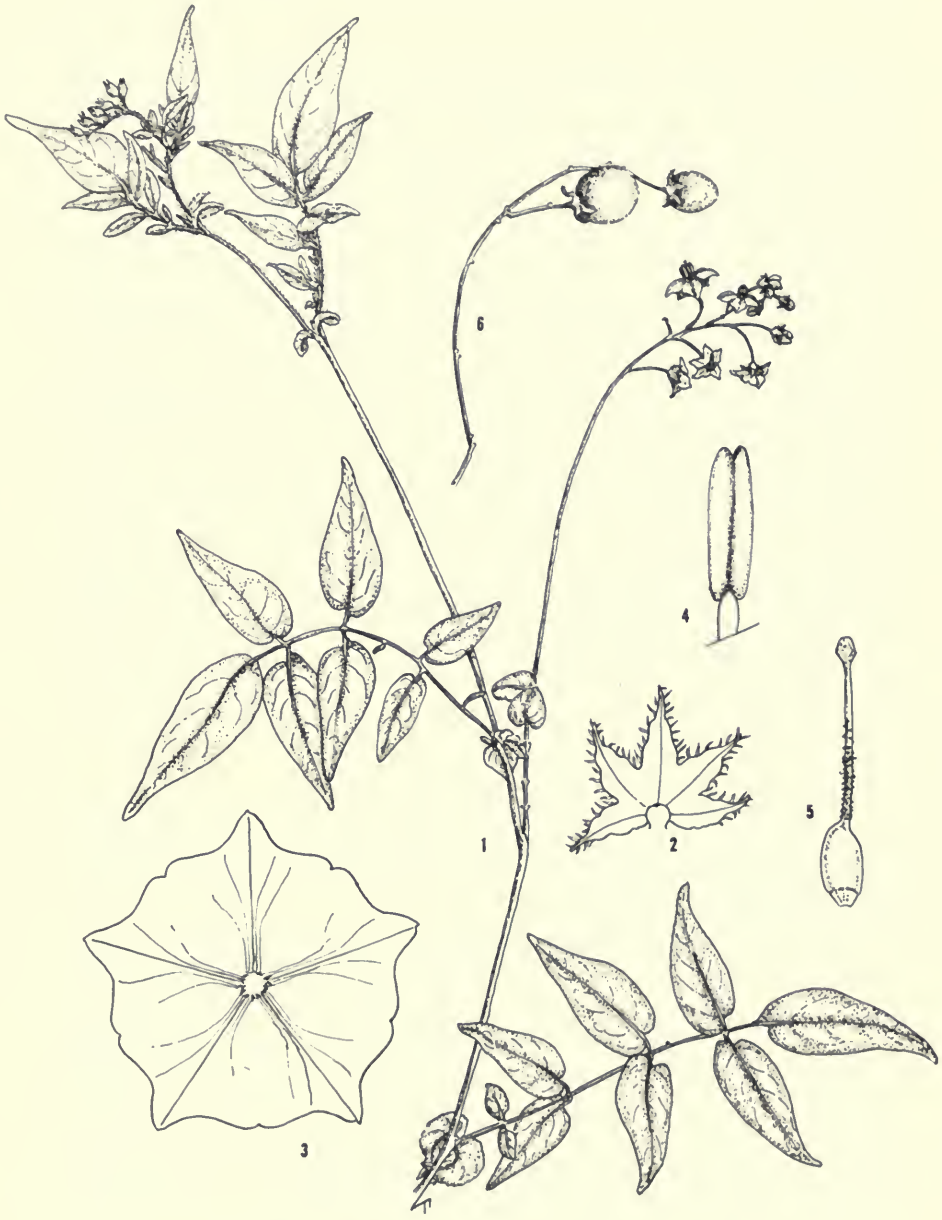

FIG. 10. *Solanum suaveolens* Kunth & Bouché. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 3; 3, corolla, spread out, × 3; 4, stamen, dorsal view, × 6; 5, pistil, × 6; 6, fruiting inflorescence, × ½.

weak, somewhat angular, branched or sometimes simple; leaves odd-pinnate, 10–27 cm. long, rather densely short-strigose on both surfaces, with few interstitial leaflets; petioles up to 4 cm. long; leaflets 7 to 13, usually 9, elliptic-lanceolate, acute to long-acuminate, rounded to broadly cuneate at the oblique base, sessile or with a slender petiolule up to 1 cm. long, 3–10 cm. long, 1–3.5 cm. wide, the lowermost pair much reduced; interstitial leaflets small, subsessile to shortly petiolulate, obovate to elliptic or ovate, obtuse to subacute, up to 8 mm. long and 5 mm. wide; pseudostipular leaves semiovate, with a semicordate base, up to 12 mm. long and 7 mm. wide; inflorescences lateral, several, a raceme; peduncles simple or very rarely once-forked, up to 9 cm. long, slender, subtended near the base by a pair of pseudostipular leaves, sparsely appressed-pilose to subglabrous; pedicels filiform, 7–10 mm. long, articulate at the base; flowers white or yellowish, fragrant, usually 10 or more; calyx up to 5 mm. long, strigose to subglabrous, divided to about the middle into ovate to ovate-lanceolate or narrowly lanceolate acute to acuminate lobes; corolla rotate-pentagonal, 1–1.3 cm. in diameter, with short lobules 1 mm. or less long, more or less strigose on the outer surface; anthers oblong in outline, about 3 mm. long; filaments 0.5–1 mm. long, sometimes united part way; style about 3.5 mm. long, slightly exceeding the stamens, cellular-papillose, the stigma globose and slightly notched; fruit ovoid to globose, green striped with dark purplish green, about 2 cm. long and 1.5 cm. in diameter.

Characteristics that readily distinguish this species are a simple peduncle that is provided with appressed tawny hairs; lanceolate, acute to acuminate calyx-lobes; rotate corolla; leaves without or with very few interstitial leaflets.

Ayacucho: Río Apurímac Valley, near Kimpitiriki, 400 m. alt., *Killip & Smith 22971*.—Cuzco: Quelloum, 950 m. alt., *Bues s.n.* Santa Ana, about 900 m. alt., *Cook & Gilbert 1682*.—Huánuco: Las Cueras, Tingo María, in deep ravine, 625–1,100 m. alt., *Allard 20545*. Tingo María, *Asplund 12092*. Steep sunny rocky slope, *Asplund 12094*. Tingo María, edge of corn field, *Blood & Tremelling 65*. Vicinity of Tingo María, Km. 138, *Ferreyra 923*. On road to Monzón, near Tingo María, tropical forest, 650–750 m. alt., *Ferreyra 12663*. In mountains near "Huanocco," *Haenke s.n.* Right bank of Río Huallaga, near Cayumba, undergrowth in cleared forest, 790 m. alt., *Mexía 8334*. Near Río Huallaga, 3 km. north of Tingo María, sandy gravelly bank, 700 m. alt., *Stork & Horton 9449*. Tingo María, *Soukup 2285*.—Ica: Pampayacu, Hacienda at mouth of Río Chincha,

about 1,000 m. alt., trailing along rocky wood road, *Macbride 5072.* —Junín: Prov. Tarma, near San Ramón, Valley of Chanchamayo, in thicket of tropical forest, 800–900 m. alt., *Constance & Tovar 2276.* La Merced, wooded valley, about 700 m. alt., *Killip & Smith 24055.* Along Río Perene, near "Hacienda 3," Colonia Perene, thickets, about 600 m. alt., *Killip & Smith 25219.*—Loreto: Puerto Arturo, lower Río Huallaga below Yurimaguas, thickets, about 135 m. alt., *Killip & Smith 27851.* Lower Río Huallaga, Fortaleza, Yurimaguas, *Williams 4279.* Lower Río Huallaga, Fortaleza, edge of forest, Yurimaguas, *Williams 4480.* Lower Río Huallaga, forest, Puerto Arturo, Yurimaguas, *Williams 5058.* Lower Río Huallaga, Puerto Arturo, Yurimaguas, *Williams 5322.*—San Martín: on roadside to Pucallpa, 625–1,100 m. alt., *Allard 20715.* Zepelacio, near Moyobamba, mountain forest, 1,200–1,600 m. alt., *Klug 3524.* Chazuta, Río Huallaga, forest, 260 m. alt., *Klug 4139.* Near Tarápoto, *Spruce 3938.* San Roque, forest, *Williams 7985.* San Roque, forest, *Williams 7095.* 4 miles east of Tarápoto, in sunny place around huge fallen tree in forest, 890 m. alt., *Woytkowski 35231.*—Tumbes: Pampa Hospital, 500 m. alt., *Velarde Nuñez 329.* Mountains east of Hacienda Chicama, 800–900 m. alt., *Weberbauer 7640.*—Indefinite: Casapi, *Mathews 1965.* Cuchero, *Poeppig 1472.*

Series 5. JUGLANDIFOLIA

Juglandifolia Rydb., Bull. Torrey Bot. Club 51: 146, 173. 1924.

Plants erect or viny shrubs or high-climbing vines, non-tuber-bearing; leaves odd-pinnate; leaflets inarticulate; flowers yellow or rarely dull whitish; pedicels articulate at about or above the middle; corolla rotate-pentagonal or stellate; fruit globular.

The inclusion of this series in subsection Hyperbasarthrum is somewhat anomalous. Also, the species comprising the series are extremely heterogeneous. Their common characteristic, yellow flowers, denotes their apparent near relationship to the segregate genus *Lycopersicon.* They differ from the tomatoes, however, primarily in lacking floral bracts and a sterile tip to their anthers. They are included here on the basis of their having pedicels articulate at some distance above the base. It is quite possible that our purpose would be best served if they were segregated as a distinct subsection in section Tuberarium.

From the mountains of Central America and northwestern South America as far south as northern Chile.

Leaflets variously dissected.....*S. lycopersicoides.*
Leaflets of an elliptic to lanceolate type, entire.....*S. ochranthum.*

Solanum lycopersicoides Dun. in DC., Prodr. 13(1): 38. 1852; Bitt., Repert. Sp. Nov. 11: 466. 1912. *Figure 11.*

In clays or volcanic soils on open slopes among boulders and in quebradas, 2,800–3,140 m. alt. Extreme southern Peru.

Plant shrubby, glandular-pubescent throughout, up to 2.5 m. tall, non-tuber-bearing; stem woody, erect or tortuously ascending; leaves asymmetrically pinnate-pinnatifid, up to 13 cm. long, with numerous toothed interstitial leaflets; leaflets 7 to 11, sessile to decurrent on the rachis or rarely shortly petiolulate, irregularly pinnatifid, up to 5 cm. long, with the pinnules often toothed and the ultimate segments obtuse to acute; pseudostipular leaves lobed similarly to the leaflets, about 1 cm. long; inflorescence terminal, subterminal or terminal on the branches, cymose, many-flowered; peduncle rather stout, 4–9 cm. long; pedicels slender, up to 12 mm. long, articulate 1–2 mm. below the calyx; flowers bright yellow, showy; calyx 3.5–5.5 mm. long, divided to about the middle into ovate to ovate-lanceolate acute to acuminate lobes; corolla rotate-pentagonal to rotate-substellate, about 2 cm. in diameter, with short triangular lobes, coarsely pubescent on the outer surface; anthers 3.5–5 mm. long, oblong-elliptic in outline, opening by 2 large pores at apex that commonly become longitudinal slits on the inner surface extending from the apex to base; filaments filiform, sometimes papillose, 1–2 mm. long, united at the swollen base to enclose the ovary; style 7–12 mm. long, slender, recurved above middle, pubescent below, with a conspicuously clavellate stigma; fruit globose, about 1 cm. in diameter, purple-black, marked with green, the pulp remaining moist long after ripening due to the thick chartaceous pericarp.

Of the several collections of *S. lycopersicoides* which I have examined no two are exactly identical. Although there are noticeable variations, especially in the leaf-size and dissection, it seems best to recognize the material as representing a variable species rather than to attempt varietal segregations based on minor characters.

Tacna: Cordillera de Palca, *d'Orbigny 291*. 38 km. from Tacna on road to Charaña (Bolivia), 7 km. west of Palca, about 3,000 m. alt., in quebrada with *Lycopersicon chilense, Rick SAL215*. Quebrada de Palca, *I. von Tschudi s.n.* Cordillera de Palca, *Weddell s.n.* Prov. Parata, near Candarave, dry open hillside, in clay and volcanic rock, 2,800 m. alt., *Metcalf 30382*. Prov. Tarata, on east shore of Lake

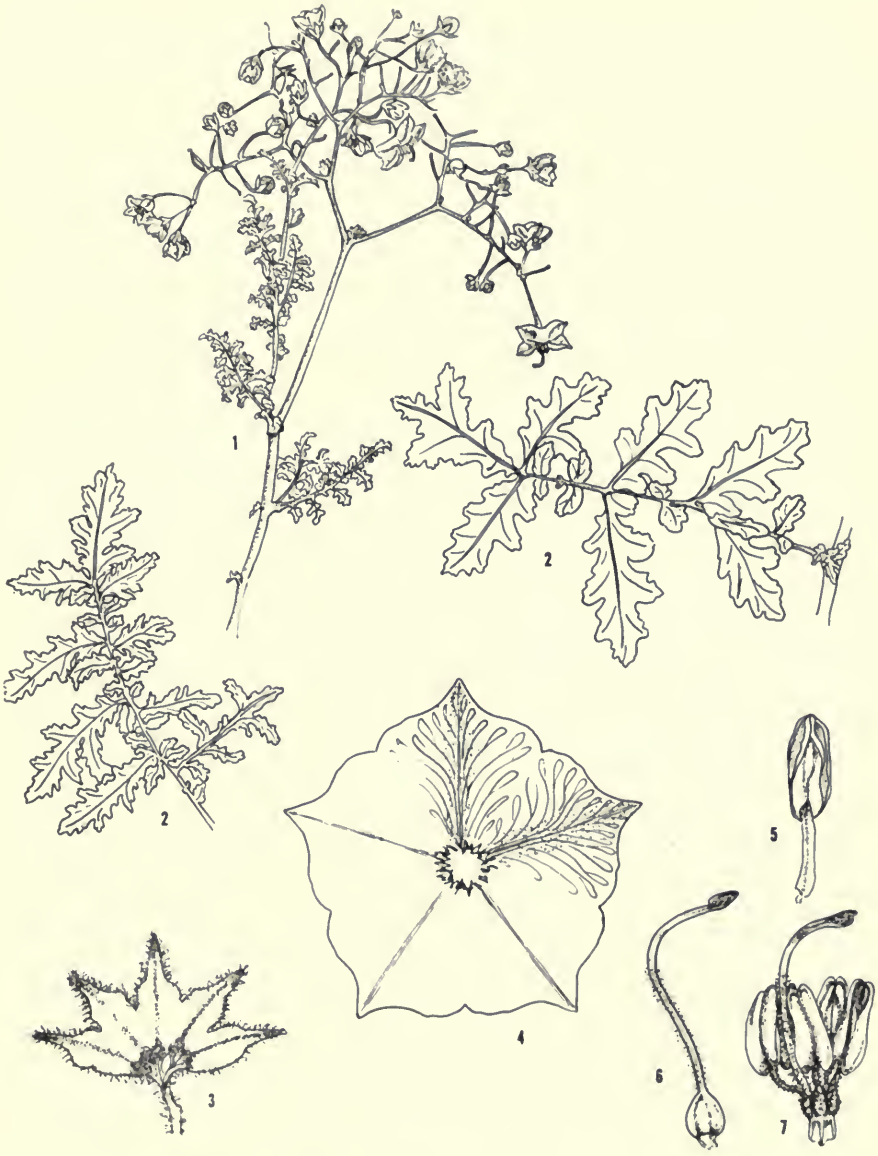

FIG. 11. *Solanum lycopersicoides* Dun. 1, flowering branch, × ½; 2, two types of leaves from same plant, × ½; 3, calyx, attached to pedicel and spread out, × 3; 4, corolla, spread out, × 2; 5, stamen, ventral view to show slits, × 3; 6, pistil, × 3; 7, stamens and pistil in natural position, × 3.

Aricota, open hillside among lava boulders, 2,900 m. alt., *Metcalf 30404*. Causiri, 1 km. from Palca (in Quebrada de Palca) and 45 km. from Ciudad Tacna, 3,140 m. alt., *Ochoa 2035*.

Solanum ochranthum Dun., Solan. Syn., Montpellier 6. 1816. Type: Ecuador, near Chillo; Bitt., Repert. Sp. Nov. 11: 462. 1912. *S. ochranthum* var. *glabrifilamentum* Bitt., Repert. Sp. Nov. 11: 466. 1912; Engl. Bot. Jahrb. 50 (Beibl. III): 58. 15 Ap. 1913. *Figure 12*.

In thickets, on the edge of forests, and in hedgerows, barrancas and on steep ravine slopes, soil pH 7.2–7.4, 1,800–3,500 m. alt. Colombia, Ecuador and Peru.

Plant large, coarse, lax and bushy or viny, more or less pubescent throughout, up to 12 dm. or more tall, non-tuber-bearing; stem stout, woody, often climbing; leaves odd-pinnate, usually with numerous variously sized interstitial leaflets, up to 32 cm. long, thick-herbaceous, mostly hirsute above and tomentose-canescent beneath, rarely subscabrous above with the hairs somewhat pustulate; petioles about 4 cm. long; leaflets 9 to 13, rarely 15, sessile or rarely with a short petiolule up to 6 mm. long, oblong-elliptic, obtuse to acute or occasionally acuminate, obliquely rounded or tapering at base, 5–12 cm. long, 2–5 cm. wide, the lowermost pair much reduced, prominently veined (especially beneath); terminal leaflet similar to the lateral ones but occasionally longer and wider; pseudostipular leaves in pairs, semi-ovate, obtuse to subacute, up to 3 cm. long; inflorescence cymose, lateral, much-branched, subdichotomous, glandular-pubescent (especially on the branches and pedicels), as much as 30 cm. across, often very showy; peduncle stout, elongate, 6–15 cm. long; pedicels conspicuously short, up to 1.5 cm. long, usually less than 1 cm. long, articulate about the middle or near the calyx, with the articulation prominent; flowers brilliant yellow, odoriferous, often pungent, usually numerous; calyx 4–7 mm. long, divided to above the middle into broadly triangular acute lobes; corolla up to 3.5 cm. in diameter, rotate-stellate to subrotate, divided to above the middle into broadly ovate acute to acuminate lobes; anthers 5–7 mm. long, oblong in outline, laterally dehiscent their entire length, papillose on inner surface; filaments stout, pubescent to glabrous, 1.5–3 mm. long; style 8–13 mm. long, slender, exceeding the anthers, pubescent on lower half; stigma stout; fruit globose, up to 6 cm. in diameter, with a tough thick coat, grass-green and glabrous.

Some herbarium specimens of this species and the allied Ecuadorean *S. juglandifolium* often resemble one another closely. In the

FIG. 12. *Solanum ochranthum* Dun. About × ½ (*re-drawn from drawing in Montpellier Herbarium*).

field, however, these two plants are readily distinguishable. The leaflets of this species are nearly always sessile or essentially so, whereas at least some of those of *S. juglandifolium* are usually noticeably petiolulate. The leaflets are also more closely spaced than in *S. juglandifolium* and are even often somewhat overlapped. They are also usually more elliptic and obtuse than in that species. It is of interest that the anthers of *S. ochranthum*, besides having prominent apical pores, readily dehisce for most of their length.

Amazonas: Chachapoyas, Samanga, Valley of Utcubamba, 1,800–1,900 m. alt., *Ochoa 1694*. Chilingote, near Leimebamba, 1,900 m. alt., *Ochoa 1695*.—Apurímac: near the river in Abancay, rocky places, 2,400 m. alt., *Vargas C. 460*. Abancay, "Cachoro," 3,000 m. alt., *Vargas 9135*. Andahuaylas, Río Pampa, Hacienda Cotahuacho, 2,600–2,700 m. alt., *Weberbauer 5907*.—Cuzco: near Piscacucho, vicinity of Machu Picchu, *Blood & Tremelling 184*. Between Ollantaytambo and Torontoy, 3,000 m. alt., *Cook & Gilbert 829*. Torontoy, Urubamba Valley, 2,400 m. alt., *Cook & Gilbert 1185*. Urubamba, among rocks, between Salapuncu and Sta. Rita, 2,500 m. alt., *Vargas 8108*. Urubamba Valley, near Cedrobamba, in damp location, margin of dense riverside woods, 2,100 m. alt., *West 6461*.—Huancavelica: between the Haciendas Tocas and Pilcos, Prov. Tayacaja, 1,900–2,200 m. alt., *Ochoa 973*. Tayacaja, Salcabamba, shrubland, in gravel and black loam soil, 3,250 m. alt., *Stork & Horton 10276*.—Junín: along road to Satipo, Calabaza, *Soukup 2874*.—San Martín: Huambos, about 2,000 m. alt., *Soukup 4452*.—Indefinite: *Gay s.n.* Scandent, quebrada of "Parichuanca," *Mathews 841*.

Series 6. INGAEFOLIA

Ingaefolia Ochoa in Corr., The Potato and its Wild Relatives 129. 1962; Los Solanum Tuberiferos Silvestres del Peru 68. 1962 [1963].

Bushy and straggly or erect subshrubby or herbaceous plants, with tuber-bearing stolons or rhizomes that produce plants; leaves odd-pinnatifid, the rachis winged; pedicels usually articulate just below the calyx; calyx variously lobed; corolla rotate; fruits globose to ovoid.

The species in this series are distinguished by their odd-pinnatifid leaves with typically prominently winged leaf-rachis and well-developed leaflets that are not noticeably decurrent on the leaf-rachis. The calyces are also usually uniquely lobed. The series is closely allied to series Piurana.

From southern Colombia through Ecuador to northern Peru.

Stem more or less winged.....*S. ingaefolium.*
Stem wingless or essentially so.
Leaflets abruptly acuminate-attenuate at apex; calyx-lobes apiculate.....*S. raquialatum.*
Leaflets obtuse to subacute at apex; calyx-lobes obtuse to acute.
Plant glabrous.....*S. jalcae.*
Plant somewhat pilose throughout.....*S. jalcae* var. *pubescens.*

Solanum ingaefolium Ochoa, Agronomía (Lima) 26: 319, Figs. 1959. *Figure 13.*

Plant erect to erect-ascending, up to 9 dm. tall, stoloniferous and tuber-bearing; tubers ellipsoid to oval, white, up to 10 cm. long; stem stout, up to 1 cm. thick, branched below, the internodes short, broadly and sinuously crisp-winged; leaves odd-pinnatifid, the largest up to 3 dm. long, usually much shorter, without interstitial leaflets; rachis broadly winged; leaflets 3 to 7; lateral leaflets narrowly elliptic to elliptic-lanceolate, acute to acuminate at the apex, tapering at the sessile base and decurrent on the rachis, up to 6.5 cm. long and 2.5 cm. wide; terminal leaflet about the same as the lateral leaflets but sometimes rhombic-lanceolate and slightly larger; pseudostipular leaves semiovate, up to 2.5 cm. long; inflorescence pseudoterminal, cymose-paniculate, up to 20-flowered; peduncle pigmented, up to 1.5 cm. long; pedicels short, about 1 cm. long, articulate just below the calyx, warty (muriculate) on the upper part; flowers blue; calyx fleshy, 3–4 mm. long, divided to about or above the middle into ovate-triangular subacute lobes; corolla rotate-pentagonal, 3–3.5 cm. in diameter; anthers about 5.5 mm. long, lanceolate in outline; filaments 1–2 mm. long, glabrous, united for about half their length to form a crown; style stout, 8–9 mm. long, cellular-papillose below, the stigma globose; fruit unknown (the ovary broadly ovoid).

Solanum ingaefolium and *S. raquialatum* are closely allied. There are, however, several distinctive differences in the two species. This species, in contrast to *S. raquialatum*, has prominently winged stems, the short winged leaf-rachis does not have interstitial leaflets, and the filaments are united for one-half their length above the point of attachment to the corolla-throat.

The above two species are also closely related to *S. jalcae.*

Piura: near Ayabaca, Prov. Ayabaca, Montaña de Cuyas, 2,800 m. alt., *Ochoa 1765.*

FIG. 13. *Solanum ingaefolium* Ochoa. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamens, dorsal view (note united filaments), × 3; 5, pistil, × 3.

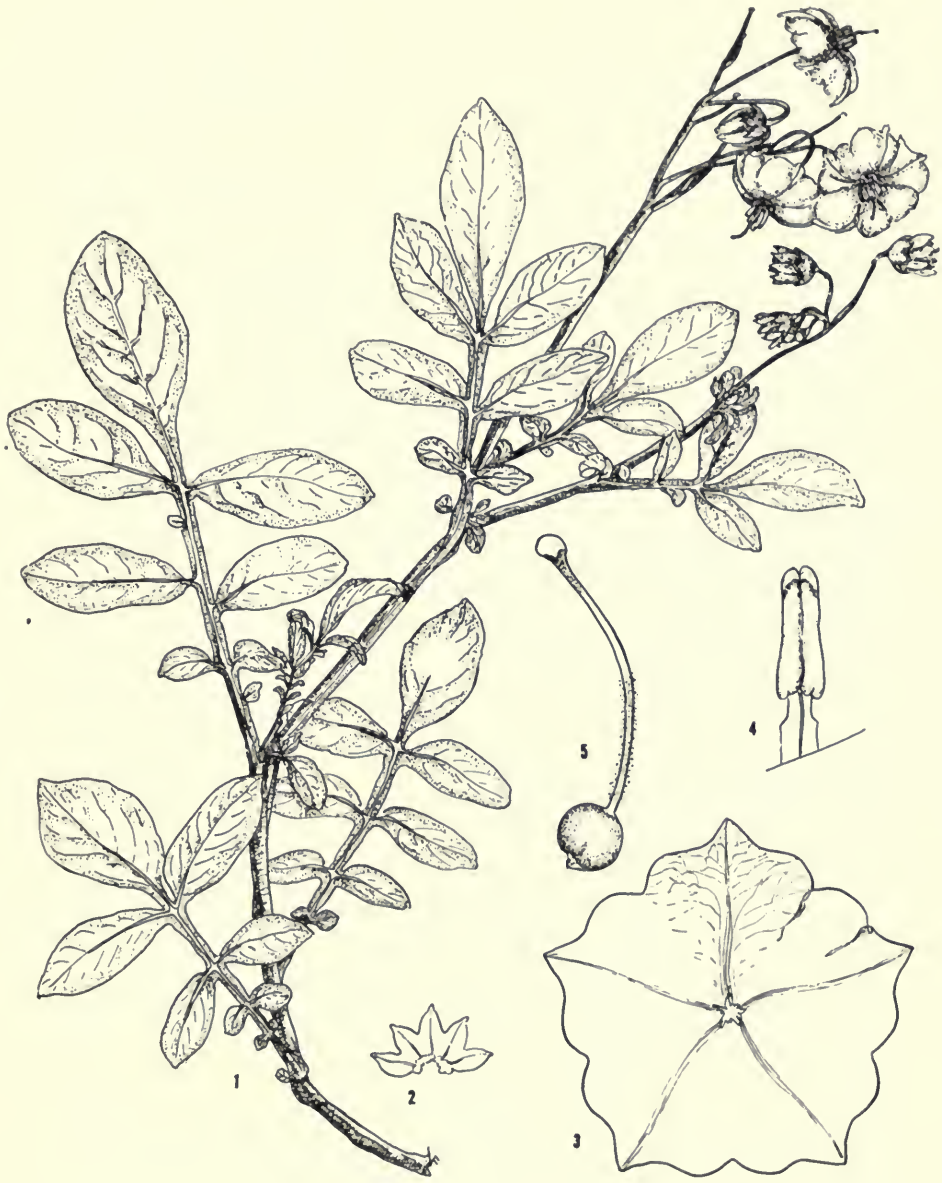

FIG. 14. *Solanum jalcae* Ochoa. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1; 3, corolla, spread out, × 1; 4, anther, dorsal view, × 3; 5, pistil, × 3.

Solanum jalcae Ochoa, Agronomía (Lima) 19: 167, Figs. 1–2. 1954. *Figure 14.*

On open grassy-rocky slopes, commonly in seepage areas, 3,100–3,550 m. alt., northern Peru.

Plant rather bushy, decumbent-ascending to erect-ascending, up to 4 dm. or more tall, glabrous throughout, rhizomatous to produce new plants and sometimes tuber-bearing; tubers small, white, globose, produced at intervals on stolons (moniliform); stem somewhat flexuous, glabrous or laxly pilose, simple or sparsely branched, essentially wingless, mostly purple-mottled; leaves odd-pinnatifid, shiny green on the upper surface, more or less tinged purplish on the lower surface, up to 16 cm. long and 9 cm. wide, without or with one to several or rarely many (in var. *pubescens*) interstitial leaflets; rachis noticeably winged; leaflets 7 or 9, rarely 5; lateral leaflets narrowly or broadly elliptic to ovate-elliptic, conspicuously decurrent at the base to form lateral wings on the rachis, obtuse to subacute at the apex, up to 5 cm. long and 3 cm. wide; terminal leaflet somewhat larger than the lateral ones; pseudostipular leaves semiorbicular, falcate, up to about 1.2 cm. long; inflorescence pseudoterminal, cymosely paniculate, up to about 20-flowered; peduncle up to 11 cm. long, divided above; pedicels up to 4 (usually about 2.5) cm. long, articulate 3–5 mm. below the calyx, tinged purplish; flowers bluish or bluish purple to dull lavender, showy; calyx 6–7 mm. long, tinged dark purple, divided to about or below the middle into ovate to triangular-ovate obtuse to acute lobes; corolla rotate-pentagonal to broadly rotate-stellate, 3–3.8 cm. in diameter; anthers lanceolate in outline, 6–7 mm. long; filaments thick, glabrous, about 1 mm. long; style 1–1.2 mm. long, cellular-papillose below the middle, the stigma slightly enlarged; fruit (immature) subglobose, about 1 cm. in diameter.

La Libertad: on seepage slope a few km. below Quiruvilca, 3,500 m. alt., *Correll & Smith P941.* Ascending from Hacienda Motil, "hacía las jalcas," 3,100–3,300 m. alt., *Ochoa 1433.*

Solanum jalcae var. **pubescens** Corr., Wrightia 1: 181. 1961.

Variety *pubescens* has a less broadly winged leaf-rachis than in typical *S. jalcae,* with quite a few interstitial leaflets. Also, instead of being glabrous, the stems, leaf-rachises, margins of the leaflets on the upper surface and lower surface of leaflets are usually sparsely pilose. In fact, with further study, this plant may eventually prove to be a hybrid between *S. jalcae* and the Ecuadorean *S. Solisii.*

FIG. 15. *Solanum raquialatum* Ochoa. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

Cajamarca: rocky grassy open slopes, near entrance to Hacienda Porcón, north of Cajamarca, 3,550 m. alt., *Correll & Smith P866.* Rocky grassy open slope, near entrance to Hacienda Porcón, north of Cajamarca, 3,550 m. alt., *Correll & Smith P867.*

Solanum raquialatum Ochoa, Agronomía (Lima) 19: 172, Figs. 6–7. 1954. *S. rachialatum* Ochoa, Agronomía (Lima) 26: 312, 322. 1959. *Figure 15.*

Plant up to 8 dm. tall, probably tuber-bearing; tubers unknown; stem stout, somewhat flexuous, wingless, tending to be purplish in exposed situations; leaves odd-pinnatifid, up to 28 cm. long and 17 cm. wide; rachis irregularly and broadly winged throughout and often with several poorly defined interstitial leaflets, dark green and rather coarsely and sparsely pilose on the upper surface, lighter green and more finely and densely pubescent on the lower surface; leaflets 7 to 11, shortly petiolulate and strongly decurrent on the basiscopic side, elliptic-lanceolate, rounded to broadly cuneate at the somewhat oblique base, acuminate-attenuate at the apex, up to 8.5 cm. long and 3.5 cm. wide, the terminal leaflet usually somewhat larger than the lateral ones; pseudostipular leaves semiorbicular, falcate, up to about 1.5 cm. long; inflorescence pseudoterminal, cymosely paniculate, with 10 or more flowers; peduncle up to 4.5 cm. long, glabrous; pedicels 1.5–3.2 cm. long, glabrous, slightly muriculate above, articulate about 3 mm. below the calyx; flowers white; calyx 3–4.5 mm. long, divided to about the middle into broadly rounded apiculate lobes with scarious margins; corolla rotate-pentagonal, about 3 cm. in diameter; anthers narrowly lanceolate in outline, minutely several-lobulate at the base, 6–7 mm. long; filaments 1–2 mm. long, glabrous or sparsely puberulent; style about 1 cm. long, papillose about the middle, the stigma somewhat swollen; fruit not seen but the ovary is ovoid.

The irregularly and broadly winged leaf-rachis and elliptic-lanceolate long-acuminate leaflets make this a most distinctive species. When first described, this species was placed in the series Megistacroloba, apparently because of the decurrent lateral leaflets and winged leaf-rachis.

Piura: Prov. Huancabamba, quebradas west of Canchaque, common in weedy growths, clay, 1,200 m. alt., *Stork 11394.*

Series 7. PIURANA

Piurana Hawkes, Ann. and Mag. Nat. Hist., ser. 12, 7: 693. 1954.

Short bushy to erect and robust plants with rhizomes or stolons that may or may not produce tubers; leaves odd-pinnate, often subcoriaceous, with or without interstitial leaflets; leaflets glabrous to coarsely or harshly pubescent on the upper surface, vernicose on the upper surface (even when pubescent), the occasionally undulate-crenulate to erose margins somewhat revolute, sometimes strongly pigmented; pedicels variously articulate above the base; corolla mostly showy; fruits globose to ovoid or rarely ovoid-ellipsoid.

This series, probably more than any of the others, may be considered as a catch-all. Paradoxically, its component species are held together not so much by their similarity as by their differences. The individual species, when first encountered, either in the field or in the herbarium, impress one by their distinctiveness. They are, for the most part, totally different from one's concept of the general habit and appearance of the commonly cultivated potato.

The species in this series consist of those plants that have leaflets that are either glabrous or glabrescent and vernicose on the upper surface or which have thick, subcoriaceous leaflets that are coarsely or even harshly pubescent on the upper surface and whose occasionally undulate-crenulate margins are somewhat revolute. Usually, even when pubescent, the upper surface of the leaflets is glossy.

Series Piurana is closely related to series Conicibaccata. The fact that some species apparently do not produce tubers and some have long-ovoid, apically blunted fruits, while others, as *S. piurae*, apparently have globose fruits, is significant since this rather vegetatively distinct group of species evidently forms a bridge with series Ingaefolia, as it were, from the non-tuber-bearing, globular-fruited series Etuberosa to the conical-fruited, usually tuber-bearing, series Conicibaccata. The usually high articulation of the pedicel also shows a close relationship with the latter series.

From southern Colombia to southern Peru, mainly in southern Ecuador and northern Peru.

Leaves without interstitial leaflets.

Lateral leaflets large and usually coarse, up to 11 cm. long and 3.5 cm. wide.

Lateral leaflets sessile, subcoriaceous, densely and harshly hispid. *S. chiquidenum.*

Lateral leaflets more or less petiolulate, rather thin-textured and thinly hispid..... *S. chiquidenum* var. *cachicadense.*

Lateral leaflets smaller than those above, up to 6 cm. long and 2 cm. wide.

Leaves typically with two pairs of well-developed lateral leaflets. *S. cantense.*

Leaves typically with a 3-leaflet aspect, the lowermost second pair of lateral leaflets greatly reduced.....*S. acroglossum.*

Leaves (at least some) with interstitial leaflets.

Lower surface of leaflets densely short-pilose to puberulent or with gray crinkly hairs.

Upper surface of leaflets rather densely pubescent.

Leaflets with coarse harsh hairs. *S. chiquidenum* var. *porconense.*

Leaflets with rather fine hairs.

Pedicels and calyx densely pilose.

Plant usually somewhat glandular.....*S. pampasense.*

Plant not glandular..*S. marinasense* f. *longimucronatum.*

Pedicels and calyx essentially glabrous or only slightly pilose or puberulent.....*S. chomatophilum* f. *pilosum.*

Upper surface of leaflets essentially glabrous to only slightly pilose.

Plant somewhat glandular; hairs gray and crinkly. *S. pampasense* f. *glabrescens.*

Plant and hairs not as the above.

Pedicels and calyx glabrous or only lightly puberulent; leaflets with repand-undulate to crenulate margins. *S. Earl-Smithii.*

Pedicels and calyx densely pilose.

Leaflets somewhat marginally toothed; interstitial leaflets numerous...*S. marinasense* var. *dentifolium.*

Leaflets not marginally toothed; interstitial leaflets very few.....*S. marinasense.*

Lower surface of leaflets essentially glabrous or only sparsely pilose (and this on the veins).

Leaflets mostly noticeably marginate (that is, undulate, crenulate-dentate or erose).

Terminal leaflet greatly exceeding in size the lateral leaflets, broadly elliptic to suborbicular, abruptly acuminate-attenuate.....*S. hypacrarthrum.*

Terminal leaflet not as above.

Leaflets mostly conspicuously petiolulate.....*S. immite.*

Leaflets mostly sessile or not conspicuously petiolulate.

Pedicel articulate below the middle; distribution in coastal loma vegetation zone of Peru.....*S. mochiquense.*

Pedicel articulate above the middle or near the calyx; distribution in high mountains.....*S. piurae.*

Leaflets not noticeably marginate.

Leaflets typically broadly elliptic and obtuse.

Plant producing tubers in a necklace; pedicels prominently articulate 2–3 mm. below the calyx....*S. moniliforme.*

Plant apparently non-tuber-bearing or with a few brittle tubers, mostly with woody stolons; pedicels articulate more than 3 mm. below the calyx...*S. chomatophilum.*

Leaflets typically elliptic-lanceolate and acuminate.

Calyx with attenuate lobes that are more or less fused. *S. chomatophilum* f. *angustifoliolum.*

Calyx not as above.....*S. immite* var. *vernale.*

Solanum acroglossum Juz., Bull. Acad. Sci. U.R.S.S., ser. Biol. 2: 313. 1937. *S. paucissectum* Ochoa, Agronomía (Lima) 27(4): 365, Figs. 1960 (type: Peru, Dept. Piura, Ciénago Largo, between Paso Cuello del Indio and Huancabamba, 3,180 m. alt., May 5, 1960, *Ochoa 2321*). *Figure 16.*

In mountains, 2,700–3,180 m. alt. Northern and central Peru.

Plant suberect to erect-ascending, up to about 7.5 dm. tall, stoloniferous and tuber-bearing; tubers whitish, globose, about 2 cm. in diameter; stem simple to slightly branched, terete below to somewhat angular above, glabrous or very sparingly short-pilose; leaves simple on lower part of stem, odd-pinnate on upper part of stem, without interstitial leaflets, up to 15 cm. long, the rachis more or less bisulcate above; petiole up to 2.5 cm. long; leaflets 3 or 5 (when not simple), the more or less revolute margins often subdenticulate and with short coarse bristly hairs, dark green and vernicose and sometimes minutely glandular on the upper surface, light green and white-granulose and sometimes with scattered hairs (especially on the veins) on the lower surface; lateral leaflets sessile, commonly basiscopically decurrent on the leaf-rachis, oblong to elliptic-lanceolate or lanceolate, obtuse to acuminate at apex, narrowed at base, up to 6 cm. long and 1.6 cm.

FIG. 16. *Solanum acroglossum* Juz. 1, flowering plant, × ½; 2, inflorescence from a more mature plant, × ½; 3, calyx, spread out, × 1½; 4, corolla, spread out, × 1½; 5, stamen, dorsal view, × 3; 6, pistil, × 3.

wide, usually much smaller, the basal pair (when present) greatly reduced; terminal leaflet elliptic-lanceolate to oblong-lanceolate or rarely narrowly obovate-lanceolate, cuneate at the base, obtuse to acuminate at the apex, up to 10 cm. long and 3.5 cm. wide; pseudostipular leaves falcate, up to about 1 cm. long; inflorescences pseudoterminal and/or lateral, few-flowered; peduncle slender, glabrous, up to 5 cm. long, usually much shorter, branched above; pedicels slender, glabrous, up to 2.5 cm. long, articulate at about or usually above the middle; flowers white marked with violet-color or obscurely violet-blue; calyx fleshy-thickened, pigmented, 5.5–7 mm. long, glabrous, divided to about or below the middle into ovate-subquadrate to ovate-lanceolate more or less abruptly acuminate lobes; corolla rotate to broadly rotate-substellate, eventually spreading, 2.5–3 cm. in diameter, the acumens usually somewhat cucullate; anthers 6–8 mm. long, linear-lanceolate in outline; filaments 1–1.5 mm. long, glabrous; style 1–1.1 cm. long, subglabrous to minutely cellular-papillose below the middle, narrowed into the ovary, slenderly clavellate into the globose stigma; fruit ovoid, up to 2 cm. long, green and mottled with purple.

The characteristics attributed to this species are, for the most part, not too unlike those found in some specimens of *S. piurae*, to which this species is strongly allied to the point of possibly representing only an extreme condition of that species. Its only real differences, if there be any, that I can find from typical *S. piurae* are its usually prominent 3-leaflet aspect with the pair of lateral leaflets more decurrent on the leaf-rachis, the complete lack of interstitial leaflets, and the usually light blue-violet or purplish instead of the usually whitish flowers. It is of interest that the flowers of the plant described as *S. paucissectum*, the type of which I have unfortunately not seen, are said to have whitish flowers with a yellowish central star and lilac-colored acumens.

Huánuco: Pillao, scarce, 2,700 m. alt., *Woytkowski 32* (*34032*).—Junín: near Cerro de Pasco, between Cajamarca and Huariaca, *Juzepczuk 10672*.

Solanum cantense Ochoa, Agronomía (Lima) 26: 217, Fig. 1959. *Figure 17*.

Plant slender, erect-ascending, up to 5 dm. tall, stoloniferous and tuber-bearing; tubers whitish, globose to ellipsoid, 1.5–3.5 cm. long; stem slender, brownish, terete, not winged, with a few long scattered silvery hairs; leaves odd-pinnate, shortly petiolate, glabrous and vernicose on upper surface, with the somewhat revolute margins shortly

FIG. 17. *Solanum cantense* Ochoa. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1; 3, corolla, spread out, × 1; 4, corolla-acumen to show cucullate condition, × 3; 5, stamen, dorsal view, × 2; 6, pistil, × 2.

hispidulous, up to 11 cm. long and 8 cm. wide, without interstitial leaflets, the rachis with a few long scattered silvery hairs; leaflets 5 or 7; terminal leaflet elliptic-lanceolate, acuminate at apex, rounded at base, up to 6.5 cm. long and 2.5 cm. wide, larger than the lateral leaflets; lateral leaflets essentially sessile, lanceolate, acute to acuminate at apex, rounded at the oblique base, up to 5.5 cm. long and 1.8 cm. wide; pseudostipular leaves semi-ovate, lunate, about 1 cm. long; inflorescence pseudoterminal, up to 16-flowered; peduncle up to 6 cm. long; pedicels 1.5–2.5 cm. long, articulate well above the middle; flowers white, with a yellow star; calyx membranaceous, subglabrous or with a few bristly hairs, 6–8 mm. long, divided to about or below the middle into ovate-lanceolate attenuate lobes; corolla rotate, 2.5–3.5 cm. in diameter, the slender-attenuate acumens cucullate; anthers lanceolate in outline, 6–6.5 mm. long; filaments 1–2 mm. long, glabrous; style about 1 cm. long, lightly cellular-papillose below the middle, the stigma sub-globose; fruits ovoid, about 1 cm. long, mottled.

This species is closely allied to *S. piurae*. However, its lack of interstitial leaflets and the cucullate acumens of the corolla-lobes set it apart from that species.

Lima: Capra Marca, near Canta, Prov. Canta, 2,800 m. alt., *Ochoa 1154*.

Solanum chiquidenum Ochoa, Biota (Lima) 1(1): 5, Figs. 1–2. 1954. *Figure 18.*

In thickets and on rocky-grassy slopes along streams and on brushy slopes, 2,800–3,400 m. alt. Northern Peru.

Plant erect to erect-ascending, robust, deep green, up to 8 dm. or more tall, stoloniferous and tuber-bearing; tubers globose, white, slightly compressed, produced at frequent intervals on the stolons (moniliform), 1–2 cm. in diameter; stem elongate, mostly thick, simple or much-branched, subglabrous or with a few scattered, short, coarse, white, sharp hairs; leaves odd-pinnate or sometimes simple on basal part of plant, subcoriaceous, harshly hispid (especially on the margins and upper surface) with sharp pustulate hairs to glabrous or subglabrous and vernicose (in var. *cachicadense*), up to 23 cm. long, with petiole up to 7.5 cm. long; leaflets 3 or 5; lateral leaflets subpetiolulate (in var. *cachicadense*) to sessile and basiscopically auriculate at the very oblique base or slightly decurrent on the leaf-rachis, lanceolate or elliptic-lanceolate to ovate-lanceolate or rarely ovate, acute to acuminate at the apex, commonly slightly falcate, up to 11 cm. long and 3.5 cm. wide; terminal leaflet similar to the lateral

FIG. 18. *Solanum chiquidenum* Ochoa. 1, upper part of flowering plant with basal bijugate leaf in background, × ½; 2, calyx, spread out, × 1½; 3, corolla spread out, × 1½; 4, stamen, dorsal view, note twist, × 3; 5, pistil, × 3; 6, tubers (moniliform), × 1.

ones but usually slightly larger; pseudostipular leaves broadly lunate, up to 1 cm. long; inflorescences often several, pseudoterminal or lateral, cymosely paniculate, up to 20-flowered; peduncle stout, glabrous or sparsely pilose, up to 10 cm. long, divided above; pedicels 1.5–2.5 cm. long, articulate above the middle or just below the calyx; flowers yellowish white or white with light lavender-color on the outer surface; calyx 6–8 mm. long, tinged with purple, divided to about the middle into ovate to ovate-lanceolate abruptly long-acuminate lobes, with the lobes fleshy-thickened and usually provided with a crenulate keel on the back; corolla rotate-pentagonal, 2.5–3.5 cm. in diameter, the acumens minutely cucullate; anthers lanceolate in outline, usually noticeably twisted, 5.5–6.5 mm. long; filaments 1–1.5 mm. long, glabrous; style about 1 cm. long, the stigma slightly globose; fruit ovoid, marbled, 1.5–1.8 cm. long.

Cajamarca: on brushy slope along small stream about 15 km. from Cajamarca on road to Bambamarca, 3,000 m. alt., *Correll & Smith P854*. On brushy slope, about 25 km. from Cajamarca on road to Bambamarca, 3,400 m. alt., *Correll & Smith P855*. Along rocky-grassy stream bank near headquarters of Hacienda Porcón, north of Cajamarca, 3,200 m. alt., *Correll & Smith P877*. Near Chiquidén, district of San Juan, 2,800 m. alt., *Ochoa 1505*.

Solanum chiquidenum var. **cachicadense** Ochoa, Agronomía (Lima) 26: 318. 1959.

In habit, var. *cachicadense* is not unlike typical *S. chiquidenum*. The subpetiolulate to shortly petiolulate, finer textured and more narrowly lanceolate leaflets that are less densely hispid readily separate it from the typical plant.

La Libertad: in briar thicket along stream near Km. 212 from Trujillo, between Huamachuco and Cajabamba, 3,050 m. alt., *Correll & Smith P919*. Prov. Santiago de Chuco, near Cachicadán, Cerro Botica or Cerro de Oro, 3,020 m. alt., *Ochoa 1469*.

Solanum chiquidenum var. **porconense** Ochoa, Agronomía (Lima) 27(4): 369, Fig. 1960 (type: Peru. Dept. Cajamarca, Jalcas de la Hacienda Porcón, above headquarters, May 14, 1960, *Ochoa 2340*).

This plant has the coarse pubescence of typical *S. chiquidenum* although it is more dense, and the flowers are essentially the same in both entities. It differs, however, in its more dissected leaves which have as many as six lateral leaflets and several interstitial leaf-

lets. The leaflets of the var. *porconense* are also somewhat shorter and broader than in typical *S. chiquidenum*. Ochoa also emphasizes the presence of a strong pigmentation which may not be too evident in dried specimens.

I am not entirely satisfied with the present disposition of this plant. Ochoa states that the variety *porconense* bore round, white tubers that were 1–2 cm. in diameter, and Dr. Smith's and my collection from Ancash Department referred to here had individual white, pyriform tubers about 2.5 cm. long. Our collections of typical *S. chiquidenum*, however, had globose tubers produced at regular intervals along a slender rhizome, thus being moniliform in character. Perhaps further study will warrant the complete separation of these two entities.

Ancash: open grassy-brushy slope about 5 km. below Jupash, 2,900 m. alt., *Correll & Smith P947*.

Solanum chomatophilum Bitt., Abhandl. Naturwiss. Ver., Bremen 25: 246. 1924. *Figure 19*.

On rocky-grassy slopes and in thickets or occasionally woodlands, in ravines, canyons and along streams, 2,500–4,100 m. alt., usually above 3,000 m. Southern Colombia and Ecuador to central Peru.

Plant mostly bushy, erect or erect-ascending, up to 9 dm. or more tall, usually much less tall, essentially glabrous throughout or rarely with densely pilose stem and leaves (in f. *pilosum*), commonly with large thick woody stolons from a mother-plant that gives rise to new plants, sometimes producing whitish brittle tubers, essentially glabrous throughout; stem simple to much-branched, commonly mottled with purple; leaves odd-pinnate, up to 22 cm. long, mostly about 8 cm. long, without or with several small interstitial leaflets, dark green and vernicose on the upper surface, paler green on the lower surface; leaflets 5 to 9, rarely 3, sessile to conspicuously petiolulate (rarely with secondary leaflets on the petiolules), the margins usually only slightly revolute and sometimes lightly puberulent; lateral leaflets ovate-elliptic to broadly elliptic or elliptic-lanceolate, broadly rounded to obtuse or acute to shortly acuminate at the apex, somewhat rounded to cuneate at the oblique base, 2–8 cm. long, 1–4 cm. wide; terminal leaflet similar to the lateral ones but somewhat larger, up to 9.5 cm. long and 5.5 cm. wide; pseudostipular leaves lunate, falcate, about 1 cm. long; inflorescence pseudoterminal, subumbellate to cymosely paniculate, laxly few- to 12-flowered; peduncle slender, 3.5–10 cm. long; pedicels 1.2–3 cm. long, articulate above the middle

FIG. 19. *Solanum chomatophilum* Bitt. 1, portion of flowering plant, × ½; 2, calyx, spread out, × 1; 3, corolla, spread out, × 1; 4, stamen, dorsal view, × 2; 5, pistil, × 2; 6, fruit, × 1.

(rarely at the base), conspicuously dilated into the calyx; flowers purplish or violet-color; calyx 4–6 mm. long, divided to about or above the middle into broadly triangular to triangular-ovate or shortly ovate-lanceolate obtuse to shortly acuminate lobes, often purple, the margins usually scarious; corolla rotate-pentagonal to sometimes broadly rotate-stellate, 2–4 cm. in diameter; anthers 5–7.5 mm. long, elliptic-lanceolate in outline; filaments 1.5–2 mm. long, broad, puberulent or glabrous; style 8–10 mm. long, densely papillose below the middle, the stigma usually rather abruptly globose; fruit broadly ovoid to ovoid-ellipsoid, somewhat cordate at base, up to 3.5 cm. long.

Ancash: Prov. Pallasca, below the mine of Huaura, 3,950 m. alt., *Weberbauer 7201*—Cajamarca: on slope about 43 km. from Cajamarca on road to Chilete, 1,950 m. alt., *Correll & Smith P840*. On rocky-grassy slope, about 1 mile north of entrance to Hacienda Porcón, north of Cajamarca, 3,500 m. alt., *Correll & Smith P862*. Rocky-grassy slopes near entrance to Hacienda Porcón, north of Cajamarca, 3,550 m. alt., *Correll & Smith P868*. Km. 60 on road from Cajamarca to Celendín, 3,400–3,500 m. alt., *Ochoa 1517*. Prov. Chota, Coñorpata, 3,000 m. alt., *Ochoa 1531*.—Huánuco: Baños, *Capt. Wilkes Expedition s.n.*—La Libertad: Pr. Santiago de Chuco, Huillilas, north of Cachicadán, in moist ravine, 4,000 m. alt., *Stork & Horton 10006*.—Lima: near Antaicocha, Cerro Colorado, east of Canta, rocky slopes and bushy thickets, 3,800–4,000 m. alt., *Pennell 14651*. Near Antaicocha, Cerro Colorado, east of Canta, about springhead in small canyon, 3,800–4,100 m. alt., *Pennell 14656*.—Piura: pass in the mountains of Huancabamba, above 3,000 m. alt., *Ochoa 1798*. 2 km. from Ayabaca to Arraypite, Ceja, growing with *Fuchsia* and *Begonia*, 2,500 m. alt., *Rimpau & H. Ross 1082 p.p.*—Indefinite: Viso, among rocks on wet slope, 2,750 m. alt., *MacBride & Featherstone 594*. 1834–1840, *Mathews 847 p.p.*

Solanum chomatophilum f. **angustifoliolum** Corr., Wrightia 2: 180. 1961.

Forma *angustifoliolum*, as its name implies, differs from typical *S. chomatophilum* in having narrower leaflets, these being lanceolate to narrowly elliptic-lanceolate and subacute to acuminate at the apex. It also usually has more numerous interstitial leaflets and the calyx, which is sometimes so irregular as to be bilabiate, has typically longer lobes.

La Libertad: near Hacienda Motil, 3,000 m. alt., *Ochoa 1436*.—Piura: Pingola near Ayabaca, 2,300 m. alt., *Rimpau & Ross 1068–1069*.

Solanum chomatophilum f. **pilosum** Corr., Wrightia 2: 180. 1961.

Except for being usually more dwarf, f. *pilosum* differs from typical *S. chomatophilum* only in having its stems and leaves rather densely pilose.

Piura: climbing from Canchaque to the pass "Cuello del Indio" on the road from Canchaque to Huancabamba, *Ochoa 1795*.

Solanum Earl-Smithii Corr., Wrightia 2: 135, Fig. 25. 1961. *Figure 20.*

In rocky loma area and in disturbed soils at somewhat higher elevation, 400–1,650 m. alt. Northern Peru.

Plant stout, bushy, up to 6 dm. or more tall, from a thick fibrous rootstock and apparently non-tuber-bearing; stem stout, more or less zigzag, puberulent, simple or branched; leaves odd-pinnate, deep green and shiny-glabrous on the upper surface, dull grayish green and densely puberulent on the lower surface, 10–27 cm. long, usually with several interstitial leaflets; rachis more or less puberulent; leaflets 7 or 9, the lowermost pair greatly reduced, sessile to shortly petiolulate, the margins repand-undulate to conspicuously crenulate; lateral leaflets asymmetrically elliptic to broadly elliptic or elliptic-lanceolate, obtuse to acute at the apex, the basiscopic side more or less auriculate at the base, the acroscopic side deeply recessed and rounded at the base, up to 9 cm. long and 4.5 cm. wide, usually much smaller; terminal leaflet similar to the lateral ones but frequently somewhat larger and sometimes suborbicular-elliptic, rounded to subcordate at base; pseudostipular leaves semi-elliptic, broadly lunate or falcate, up to 1.5 cm. long; inflorescences pseudoterminal and/or lateral, a conspicuously many-flowered and showy panicle, with the 3 main branches divergent and spreading; peduncle up to 6 cm. long, usually much abbreviated as compared with the large inflorescence, 3-branched above, essentially glabrous to lightly puberulent; pedicels 1.3–2 cm. long, articulate well below the middle or to near the base, glabrous or sparingly puberulent; flowers white and usually with a light greenish center; calyx 3–5 mm. long, shallowly lobed with the lobes broadly rounded to subquadrate and apiculate, glabrous or with a few scattered hairs; corolla rotate-pentagonal, about 2.5 cm. in diameter, the acumens more or less cucullate; anthers 5–6 mm. long, oblong-lanceolate in outline; filaments 1–1.5 mm. long, glabrous; style 9–10 mm. long, cellular-papillose on the lower half, the stigma

FIG. 20. *Solanum Earl-Smithii* Corr. 1, upper part of flowering plant, × ½; 2, calyx, spread out, with pistil partially attached, × 3; 3, corolla, spread out, note cucullate acumens, × 1½; 4, stamen, dorsal view, × 3; 5, fruit, × ½.

globose and commonly notched; fruit globose, deep green, about 1.5 cm. in diameter.

This is one of the species of apparently local occurrence, if not endemic, that are found more or less isolated in widely separated places in northern Peru. There is little doubt that when more incisive and prolonged exploration is undertaken in this region additional species new to science will be discovered.

As one progresses beyond centers of concentration of wild tuberous *Solanum* species, with their vast population development, such as the region about Lake Titicaca, one should expect distinctive and unique lines to arise among the diverging and diminishing population. In a region of great concentration of wild species as well as cultigens some interbreeding is bound to occur, in which case individual characteristics tend to be submerged or lost and hybrid swarms replace what was once perhaps many distinctive species.

Solanum Earl-Smithii shows some vegetative relationship with *S. mochiquense* and *S. cajamarquense* and, in its cucullate acumens of the corolla, some floral relationship with *S. chiquidenum*.

Cajamarca: in disturbed soil along road, 58 km. from Cajamarca, between Chilete and mountain pass, 1,650 m. alt., *Correll & Smith P836*.—La Libertad: Prov. Trujillo, Cerro Campaña, near Trujillo, rocky loma, 400–500 m. alt., *Ferreyra 8609*.

Solanum hypacrarthrum Bitt., Repert. Sp. Nov. 11: 367. 1912; Repert. Sp. Nov. 12: 151. 1913. *Figure 21*.

On hills, and in brushy forests, 1,800–3,400 m. alt. Central Peru.

Plant up to 4 dm. or more tall, stoloniferous and tuber-bearing; tubers white; stem slender or stout, flexuous, narrowly to broadly winged; leaves odd-pinnate or rarely simple, up to 18 cm. long, dark green and glabrous to subglabrous and shiny on the upper surface, much paler and lightly pilose on the veins on the lower surface, with or without small irregular interstitial leaflets, the rachis winged; leaflets 3 or 5, rarely 7, the margins undulate-crenulate to somewhat pleated; terminal (or simple) leaflet conspicuously larger than the lateral ones, broadly elliptic to suborbicular, abruptly short-acuminate at the apex, broadly rounded to subcordate and decurrent at the base, up to 12 cm. long and 10 cm. wide; lateral leaflets broadly ovate to ovate-elliptic or elliptic-lanceolate, acute to shortly acuminate at the apex, rounded to broadly cuneate at the oblique base, subsessile to sessile and decurrent on the rachis, up to 7 cm. long and 4 cm. wide;

FIG. 21. *Solanum hypacrarthrum* Bitt. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 2; 5, pistil, × 2.

pseudostipular leaves semi-ovate-cordate to obliquely lanceolate, falcate, 1–1.5 cm. long; inflorescence pseudoterminal, a few- to 20-flowered cymose panicle; peduncle 3–6.5 cm. long; pedicels slender, 2–4 cm. long, puberulent to subglabrous, articulate less than 5 mm. below the calyx; flowers white, showy; calyx 7–10 mm. long, divided to well below the middle into ovate-lanceolate to lanceolate acute to acuminate lobes, usually sparsely pilose; corolla broadly rotate-pentagonal, spreading-reflexed, 2.5–3.5 (rarely up to 5) cm. in diameter; anthers lanceolate in outline, 5–7 mm. long; filaments 1–1.5 mm. long, glabrous, tapering from a broad base; style 9–12 mm. long, slender, mostly cellular-papillose below the middle, with a narrowly slender-clavellate stigma; fruit (immature) globose-ovoid, about 1 cm. long.

This species is distinctive in the ragged appearance of its irregular leaves. The greatly enlarged terminal leaflet is quite characteristic.

Lima: in brushy woods near St. Bartolomi, Zarate, about 3,000 m. alt., with small tubers, *Diers 1128*. Cuesta of Purruchuca, *Mathews 772*. Llacllishi, near Huaquicha, east of Surco, 1,800 m. alt., *Ochoa 1163*. Prov. Canta, Cuesta de Huamantanga, 3,400 m. alt., *Ochoa 2049*.

Solanum immite Dun. in DC., Prodr. 13(1): 32. 1852. *S. Mathewsii* Bitt., Repert. Sp. Nov. 12: 53. 1913. *Figure 22*.

On hills in mountains of central Peru.

Plant erect or weakly ascending, up to 4 dm. or more tall, glabrous throughout or only slightly pilose (especially on the veins and margins of leaflets) and sometimes lightly glandular, probably tuber-bearing; stem slender; leaves odd-pinnate, 6–21 cm. long, the petiole up to 1.5 cm. long, mostly with a few interstitial leaflets; leaflets 9 or 11, subsessile to conspicuously petiolulate, sometimes decurrent on rachis, similar but with the lowermost pair of lateral leaflets much reduced, obliquely ovate-lanceolate to elliptic-lanceolate, subobtuse to subacuminate or abruptly acuminate, cuneate to subtruncate or subcordate at the very oblique base, up to 6.5 cm. long and 3 cm. wide, usually smaller, thick-textured with the margins somewhat revolute and undulate-crenulate, deep green and shining on upper surface, paler on lower surface; pseudostipular leaves lunate, falcate, up to about 1 cm. long; inflorescence pseudoterminal on the branches, cymosely paniculate, few- to many (16)-flowered; peduncle 2–8.5 cm. long, conspicuously forked above; pedicels slender, up to 3.5 cm. long, articulate at about or somewhat above the middle, often somewhat dilated into the calyx; flowers showy, apparently white; calyx short,

FIG. 22. *Solanum immite* Dun. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, with stamens still attached at center, × 1½; 4, pistil, × 3.

FIG. 23. *Solanum immite* var. *vernale* Corr. 1, flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

3–5 mm. long, divided to about or below the middle into suborbicular-ovate abruptly acute to acuminate lobes, the margins brown-scarious; corolla rotate-pentagonal, 1.5–3 cm. in diameter; anthers about 5 mm. long, oblong-lanceolate in outline; filaments broad, 1–2 mm. long, glabrous, connate below; style up to 1 cm. long, cellular-papillose below the middle, with the stigma slightly clavellate; fruit (immature) globose, about 1 cm. in diameter (ovate-oblong, *fide* Dunal).

Except for the rotate corolla, this species resembles closely the Mexican species, *S. brachistotrichum* (Bitt.) Rydb. It also is superficially similar to some plants of *S. chomatophilum*.

Lima: Cuesta of Purruchuca, *Mathews 771 p.p.* "Patatas del Peru," *Ruiz & Pavon 8/90.*

Solanum immite var. **vernale** Corr., Wrightia 2: 181. 1961· *Figure 23.*

Variety *vernale* is not only a larger plant than most of the material referable to typical *S. immite* but, as its name implies, it also flowers in the spring (August) instead of in the fall as in typical *S. immite.*

This is the second instance that I know of where plants that are otherwise basically similar are found at different times of the year at different elevations. In the case of *S. medians* and its var. *autumnale,* typical material flowers in the spring in the loma vegetational zone while the var. *autumnale* flowers in the fall at high elevations.

These two examples pose still another problem yet to be fully explored and solved in this complicated group of plants.

Lima: rocky valley, about 8 km. east of San Bartolo, about 120 m. alt., *Saunders 185.*

Solanum marinasense Vargas, Las Papas Sudperuanas, Part. 1 (Publ. Univ. Nac. Cuzco): 83, Fig. 29. 1949, nom. nud.; Part II: 53. 1956. *S. cuzcoense* Ochoa, Agronomía (Lima) 26: 219, Figs. 1959. *Figure 24.*

Among trees and shrubs on stony banks in shade or sometimes in open, in quebradas and about fields, 2,050–3,500 m. alt. Southern Peru.

Plant up to 1 m. tall, erect, stoloniferous and tuber-bearing; tubers globose, yellowish-white, the eyes superficial, up to 2.5 cm. in diameter; stem slender to stout, glabrous or slightly pilose; leaves odd-pinnate, 8–17 cm. long, deep green or yellowish green and shiny above (with only the veins sometimes minutely pilose) or (in f. *longimucro-*

FIG. 24. *Solanum marinasense* Vargas. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1; 3, corolla, spread out, × 1; 4, stamen, dorsal view, × 2; 5, pistil, × 2.

natum) densely pilose, densely whitish tomentose on the lower surface, without or with interstitial leaflets, the rachis sparsely pilose; leaflets 5 or 7, rarely 9; lateral leaflets sessile to shortly or occasionally long-petiolulate, elliptic-lanceolate, acute to acuminate, obliquely cuneate to occasionally auriculate at base, up to 7 cm. long and 2.8 cm. wide; terminal leaflet similar to but somewhat larger than the lateral ones; pseudostipular leaves about 8 mm. long, strongly lunate-falcate; inflorescence pseudoterminal, laxly several- to 18-flowered, cymosely paniculate; peduncle 3.5–7 cm. long, slender, branched above, slightly pilose; pedicels slender, 1–2 cm. long, articulate at about or below the middle and sometimes 6–8 mm. below the calyx, shortly pilose; flowers azure blue to lavender or deep bluish purple, showy; calyx 8–12 mm. long, divided to below the middle into ovate-lanceolate long-acuminate lobes, the lower margins scarious, prominently long-pilose, commonly mottled with purple; corolla rotate-pentagonal to occasionally rotate-stellate, usually about 2.5 (sometimes up to 3.5) cm. in diameter, the triangular lobes often prominent and densely pilose; anthers 6–8 mm. long, elliptic-oblong in outline, rather prominently auricled at base; filaments 1.5–2 mm. long, stout, about 1 mm. wide; style 9–10 mm. long, minutely papillose below, the stigma capitate; fruit globose, up to 2 cm. in diameter, white spotted.

In typical material, the contrast in the leaflets of a glabrous shiny upper surface with a densely tomentose lower surface is most striking.

Cuzco: wet brushy slope 9 km. from Pisac on road to Cuzco, 3,400 m. alt., *Correll, Smith & Vargas C. P225 p.p.* On shaded bank about km. 48 on railroad line between Cuzco and Ollantaitambo, *Correll & Smith P258.* Prov. Cuzco, Quebrada de las anderias, Granja de Kaira, 3,300 m. alt., *Ochoa 2142.* Prov. Calca, Huancalle, among Cactaceae and various herbs and shrubs about potato fields, 3,200 m. alt., *Rimpau, Ross & Vargas C. 798–799.* Prov. Calca, Haz, Huaran between Calca and Urubamba, in rocky area, 2,900 m. alt., *Rimpau, Ross & Vargas 806.* Prov. Calca, among brambles on slope of quebrada, Ckochocc, 2,900 m. alt., *Vargas 4073.* Prov. Calca, Intihuatana, Pisac, rocky slopes, 3,450 m. alt., *Vargas 5079.* Prov. Calca, S. Salvador, among bushes, 3,000 m. alt., *Vargas 5521.* Prov. Canchis, Combapata, 3,466 m. alt., ruderal, *Vargas ("Leg. Ing. O.") 5652.*

Solanum marinasense var. **dentifolium** Vargas, Las Papas Sudperuanas, Part II (Publ. Univ. Nac. Cuzco): 56. 1956.

This plant, in comparison with typical material, is extremely robust. The larger leaves with many interstitial leaflets and broader

more or less marginally toothed leaflets set it apart from typical *S. marinasense*.

Cuzco: Prov. Paucartambo, between Illichua and Añobamba, in rocky places on edge of road, 3,100–3,500 m. alt., *Vargas C. 5566*.

Solanum marinasense f. longimucronatum (Vargas) Corr., Wrightia 2: 181. 1961. *S. longimucronatum* Vargas, Las Papas Sudperuanas, Part II (Publ. Univ. Nac. Cuzco): 60, Fig. 17 [leaf illustrated is not typical of type material]. 1956.

Forma *longimucronatum* differs from the type of *S. marinasense* in having the usually somewhat larger leaflets densely pubescent on the upper surface instead of being essentially glabrous and shiny. Also, it has more interstitial leaflets, and the petiolules are usually longer.

The leaf used to illustrate *S. longimucronatum*, when it was originally described, is lacking interstitial leaflets. The leaves of all the type material I have seen have three or more small suborbicular interstitial leaflets.

Apurimac: Prov. Abancay, Curahuasi, Suiluluchayok, quebrada, *Vargas C. 9218*.—Cuzco: on open bank near Km. 85 along railroad between Machu-Picchu and Cuzco, *Correll & Smith P259*. Vallé del Apurímac, *Herrera s.n.*

Solanum mochiquense Ochoa, Agronomía (Lima) 26, No. 2: 111, Figs. 1959. *Figure 25*.

Plant erect-ascending, up to 5 dm. tall, stoloniferous and tuber-bearing; tubers globose, white, up to 3 cm. in diameter, the eyes superficial; stem slender, puberulent, erect-ascending to somewhat decumbent; leaves odd-pinnate, usually about 20 cm. long, sometimes as much as 30 cm., with numerous several-sized interstitial leaflets, glabrous (except for the puberulent center vein) and vernicose on upper surface, softly green and paler on lower surface, the rachis puberulent; leaflets 9 to 11, the margins undulate and irregularly crenulate-denticulate; lateral leaflets sessile to shortly petiolulate, broadly elliptic to elliptic-lanceolate, obtuse to acute at the apex, rounded at the very oblique base, up to 6 cm. long and 2.5 cm. wide; terminal leaflet similar to the lateral ones; pseudostipular leaves sublunate, up to 2 cm. long; inflorescence pseudoterminal and/or lateral, up to 12-flowered; peduncle up to 8 cm. long, divided above, puberulent; pedicels slender, about 1.5 cm. long, articulate below the middle, subglabrous; flowers white; calyx about 5 mm. long, essentially

FIG. 25. *Solanum mochiquense* Ochoa. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

glabrous to lightly pilose, shallowly divided into broadly quadrate long-apiculate lobes; corolla rotate-pentagonal, 2.5–3 cm. in diameter; anthers narrowly oblong in outline, 6.5–7 mm. long; filaments 1–1.5 mm. long, glabrous; style slender, about 1 cm. long, cellular-papillose about the middle, the small stigma capitate; fruit unknown.

Because of the occurrence of this species in the loma vegetation formation on the coast of Peru, Ochoa logically considered it to be a part of, and related to, the tuberous Solanums already known to occur there; namely, *S. Wittmackii*, *S. medians* and *S. Weberbaueri*. In my opinion, however, *S. mochiquense* seems most nearly allied to such species as *S. piurae* and *S. hypacrarthrum*.

La Libertad: Cerro Campaña, near Trujillo, Prov. Trujillo, 400 m. alt., *Ochoa 1822*.

Solanum moniliforme Corr., Wrightia 2: 182. 1961. *Figure 26.*

Plant large, robust, much-branched at base with the branches widely spreading, up to 1 m. or more tall (or long), glabrous throughout; tubers white, irregularly shaped, up to about 2 cm. in diameter, arranged in the form of a necklace on the stolons (moniliform); stem stout, very narrowly winged, up to 1.5 cm. or more thick; leaves odd-pinnate, up to 25 cm. long, without or usually with interstitial leaflets; leaflets 7 or 9, with the lowermost pair of lateral leaflets mostly greatly reduced, sessile or with a short winged petiolule, sometimes slightly decurrent on the leaf-rachis, broadly elliptic to occasionally obovate-elliptic, obtuse at apex, rounded to broadly cuneate at the oblique base, up to 10 cm. long and 5.5 cm. wide, the terminal leaflet only slightly larger than the lateral ones, prominently veiny; pseudostipular leaves semi-elliptic, lunate, up to about 2 cm. long; inflorescence pseudoterminal on the branches, showy, a many-flowered cymose panicle; peduncle stout, up to 14 cm. long, several branched above; pedicels stout, 2–4 cm. long, prominently articulate 2–3 mm. below the calyx; flowers large and showy, lavender, with a darker stripe on the back of each petal; calyx fleshy-thickened, pigmented with dark purple, 7–10 mm. long, divided to about or slightly above the middle into triangular-ovate to ovate somewhat apiculate lobes; corolla broadly rotate-stellate, up to 5 cm. in diameter; anthers broadly lanceolate in outline, about 8 mm. long; filaments broad, concave-cymbiform on the inner face, glabrous, 1–2 mm. long above their attachment to the corolla; style 1–1.2 cm. long, glabrous, with the stigma dilated; fruit unknown but the ovary is globose.

FIG. 26. *Solanum moniliforme* Corr. 1, upper part of flowering plant, × ½; 2, leaf from lower part of plant, × ½; 3, calyx, spread out, × 1; 4, corolla, spread out, with stamens attached, × 1; 5, stamen, dorsal view, × 2; 6, pistil, × 2.

This species is somewhat allied to *S. chomatophilum*. It differs primarily from the essentially tuberless *S. chomatophilum* in producing tubers that are uniquely arranged along the stolon to form a necklace. Also, it consistently has its pedicels articulate 2–3 mm. below the calyx, the style is glabrous and the plants are extremely robust.

Solanum moniliforme is similar to *S. jalcae*, of series Ingaefolia, in its manner of producing tubers and in its high articulation of the pedicel, but it differs from that species in lacking a broadly winged leaf-rachis, in its glabrous style, more numerous interstitial leaflets and in its more robust nature.

Ancash: among boulders at Km. 311, a few km. below Conococha on road to the coast, 3,900 m. alt., *Correll & Smith P974*.

Solanum pampasense Hawkes, Bull. Imp. Bur. Pl. Breed. & Genet., Cambridge 50, 125, Fig. 40. 1944; Scott. Pl. Breed. Sta., Ann. Rept. 91. 1956. *Figure 27.*

On damp ledges and about old stone walls, 2,100–2,200 m. alt. Southern Peru.

Plant usually with a semirosette or bushy habit, up to 5 dm. tall, stoloniferous and tuber-bearing; tubers small, pale brown; stem simple to somewhat branched, slender, glabrous or sparsely provided with long white spreading hairs; leaves odd-pinnate, up to 20 cm. long, provided with few to many several-sized interstitial leaflets; leaflets 9 or 11, with the margins crisped-undulate, densely pubescent with gray crinkly hairs of varying length that may or may not be gland-tipped (*fide* Hawkes), sometimes with the dark green upper surface essentially glabrous (except for the primary veins) and vernicose (f. *glabrescens*); lateral leaflets shortly petiolulate to essentially sessile, narrowly ovate-lanceolate to elliptic-lanceolate or elliptic, obtuse to acute or shortly acuminate at the apex, rounded at the very oblique base and with some more or less basiscopically auriculate, up to 5 cm. long and 2.5 cm. wide; terminal leaflet provided with a long mostly naked petiolule, usually similar to and about as large as the lateral leaflets; pseudostipular leaves broadly elliptic, lunate, up to about 1 cm. long; inflorescence pseudoterminal, many-flowered; peduncle up to 13 cm. long, divided above, sparsely pilose; pedicels 1.5–2.5 cm. long, prominently articulate above the middle, sparsely or densely pilose and sometimes minutely glandular-stipitate; flowers purple to pale blue; calyx about 10 mm. long, divided to about the middle into ovate-lanceolate acuminate lobes, fleshy-thickened and with the apical part commonly recurved, pale green with the nerves colored, sub-

FIG. 27. *Solanum pampasense* Hawkes. 1, flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

glabrous to densely pilose, sometimes conspicuously bilabiate (in f. *glabrescens*); corolla rotate-pentagonal, 3–4 cm. in diameter, somewhat reflexed; anthers 5–6 mm. long, lanceolate in outline; filaments 2–2.5 mm. long, glabrous; style 9–10 mm. long, minutely cellular-papillose below the middle, with the stigma subglobose and emarginate; fruit globose, light greenish yellow, up to 1.7 cm. in diameter.

The crisped-undulate margins of the leaves as well as the peculiar glandular-pubescence are characteristics that distinguish this species.

The crisped-undulate reflexed margins of the leaflets and the subglabrous, vernicose upper surface of the leaflets, as represented by f. *glabrescens*, place this species in series Piurana. It differs from other species in this series by its characteristic crinkly hairs, found especially on the lower surface of the leaflets, sometimes forming a thin tomentum.

Apurímac: Río Pampas valley, four leagues above Pajonal, east side of river, about 2,140 m. alt., *Balls & Hawkes 7007*.

Solanum pampasence f. **glabrescens** Corr., Wrightia 2: 183. 1961.

The plant here segregated as f. *glabrescens* more or less confirms the inclusion of this species in series Piurana. The upper surfaces of the leaflets are essentially glabrous and vernicose, and in their reflexed crisped-undulate margins they somewhat resemble the leaflets of *S. piurae*. The soft crinkly hairs of the lower surfaces of the leaflets, however, contrast markedly with the sharp pustulate hairs of *S. piurae*.

Forma *glabrescens* differs from typical *S. pampasense* not only in its essentially glabrous upper leaf-surfaces but also in its less pubescent stem, peduncle, pedicel and calyx. Also, the calyx is strongly bilabiate with the thickened lobes usually noticeably reflexed.

Apurímac: Prov. Abancay, Casinchihua, in crevices of old stone wall, 2,200 m. alt., *Stork, Horton & Vargas C. 10577*.

Solanum piurae Bitt., Engl. Bot. Jahrb. 54, Beibl. 119: 5. 1916. *S. yamobambense* Ochoa, Agronomía (Lima) 27: 367, Fig. 1960 (type: Peru, Dept. La Libertad, Prov. Otuzco, near Yamobambense, 3,160 m. alt., May 12, 1952, *Ochoa 1431*). *Figure 28.*

On rocky slopes among shrubs and grasses, 2,500–3,300 m. alt. Northern and central Peru.

Plant slender, rigidly erect to erect-ascending, up to 7.5 dm. tall, stoloniferous and tuber-bearing; tubers brittle, whitish, globose to

FIG. 28. *Solanum piurae* Bitt. 1, upper half of flowering plant, × ½; 2, base of plant showing tuber, × ½; 3, calyx, spread out, × 1½; 4, corolla, spread out, × 1½; 5, stamen, dorsal view, × 3; 6, pistil, × 3; 7, fruits, × ½.

ellipsoid, 1.5–3.5 cm. long; stem glabrous, usually sinuous, mostly somewhat branched, terete and wingless, pigmented or stramineous; leaves odd-pinnate, 6–12 cm. long, with or without small interstitial leaflets, dark green-vernicose and sparsely pilose to glabrous (except on and near margins) on upper surface, the hairs frequently pustulate or the leaf appearing to be blistered, sparsely pilose (especially on the veins) on the pale green lower surface the usually somewhat undulate margins frequently revolute and commonly marginate as well as densely short-pubescent to somewhat spinescent; rachis usually sparsely spinescent; leaflets 5 or 7, rarely 3 or 9, plane to undulate, elliptic to broadly or narrowly lanceolate, broadly acute to acuminate-attenuate at the apex, obliquely rounded and sessile to subsessile and occasionally decurrent on the rachis at the base; lateral leaflets with the uppermost pair usually much exceeding those below, up to 6.5 cm. long and 2.5 cm. wide; terminal leaflet somewhat larger than the lateral ones; pseudostipular leaves often prominent, lunate, falcate, short-spinescent (especially on the margins), up to 2 cm. long; inflorescence pseudoterminal on the branches, laxly few- to 16-flowered; peduncle up to 12 cm. long, branched above, glabrous; pedicels 1.5–3 cm. long, glabrous, prominently articulate 3.8 mm. below the calyx or rarely at about the middle, somewhat dilated into the calyx, much-elongated in fruit; flowers white or greenish white (said to be violet-color in the original description); calyx 4.5–7 mm. long, divided to below the middle into ovate-lanceolate to lanceolate acute to acuminate lobes, the lobes subglabrous to shortly pilose; corolla rotate-pentagonal to somewhat broadly rotate-substellate, spreading, 2.2–3.5 cm. in diameter; anthers 4–7 mm. long, elliptic-lanceolate in outline; filaments 1–2 mm. long, glabrous; style 8–10 mm. long, papillose up to about the middle, the stigma short and slightly thickened; fruit globose to ovoid, whitish with greenish lines, about 1 cm. long.

Solanum piurae is distinctive in having the leaflets noticeably marginate and spinescent. The sharp conspicuous hairs, especially on and near the margins of the leaflets, are most characteristic.

Lima: along road above Canta, *Correll, Smith & Ferreyra P290.* Matucana, *Macbride & Featherstone 412.* Matucana, *Macbride 2954.* Cuesta of Purruchuca, *Mathews 771 p.p.*—Piura: Prov. Ayabaca, above Ayabaca, *Weberbauer 6370.*

Series 8. CONICIBACCATA

Conicibaccata Bitt., Repert. Sp. Nov. 11: 381. 1912. *Oxycarpa* Rydb., Bull. Torrey Bot. Club 51: 145, 172. 1924.

Plants essentially glabrous to densely pilose, with fibrous roots and stolons, tuber-bearing or non-tuber-bearing; leaves odd-pinnate, with or without interstitial leaflets; pedicels variously articulate above the base; corolla rotate-pentagonal to rotate-stellate or rarely stellate, sometimes appearing to be 10-lobulate; fruits prominently ovoid to ellipsoid or conical, often acute at apex.

Other than the shape of their fruits, there appear to be no tangible characteristics to distinguish the species in this series from those in several allied series. If the long-ovoid to ellipsoid or conical fruits are not present there is no certain method for placing the plants in this series.

From southern Mexico to Bolivia.

Corolla rotate-stellate or rarely stellate, the acumens prominent.
- Calyx and pedicels densely pilose-setaceous.
  - Calyx-lobes oblong-quadrate and apiculate; no evident interstitial leaflets; terminal leaflet slightly larger than the lateral leaflets; pedicels noticeably glandular above the articulation. *S. pillahuatense.*
  - Calyx-lobes ovate-lanceolate and acuminate; interstitial leaflets present; terminal and lateral leaflets similar; pedicel not glandular. . . . . *S. Buesii.*
- Calyx and pedicels at most puberulent or sparsely pubescent, sometimes warty.
  - Pedicels more than 2.5 cm. long, articulate well above the middle.
    - Leaflets typically lanceolate and acute or acuminate. *S. laxissimum* f. *Rockefelleri.*
    - Leaflets typically elliptic and obtuse. . . *S. huancabambense.*
  - Pedicels (at least some) less than 2.5 cm. long, variously articulate but mostly at about or below the middle, rarely above the middle.
    - Lateral leaflets ovate to elliptic, obtuse to acute, rarely up to 5 cm. long.
      - Lateral leaflets long-petiolulate, broadly rounded to subcordate at base; corolla with sharp prominent acumens. . . . . *S. limense.*
      - Leaflets and corolla not as above. . . . . *S. huancabambense.*
    - Lateral leaflets elliptic-lanceolate to lanceolate, rarely ovate, prominently acute to long-acuminate, rarely less than 5 cm. long.

Leaflets glabrous to glabrescent on upper surface, lanceolate.

Pedicels with wartlike excrescences. . . . *S. claviformum.*

Pedicels without excrescences.

Corolla usually 2.5 cm. or less in diameter; anthers granular-papillose. . . . . *S. santolallae.*

Corolla usually more than 2.5 cm. in diameter, the acumens prominent; anthers not as above. *S. laxissimum.*

Leaflets rather densely and coarsely pubescent or velutinous on upper surface, mostly ovate-lanceolate to elliptic-lanceolate.

Plant velutinous throughout. *S. santolallae* f. *velutinum.*

Plant not velutinous. . . . . *S. violaceimarmoratum.*

Corolla rotate-pentagonal or occasionally with a 10-lobed aspect.

Calyx provided with scattered or numerous long coarse hairs.

Calyx usually with shallow rounded apiculate lobes; leaflets typically long-acuminate. . . . . *S. santolallae.*

Calyx usually triangular-ovate to ovate-lanceolate; leaflets typically obtuse to acute. . . . . *S. huancabambense.*

Calyx glabrous to subglabrous or at most puberulent or finely pubescent.

Leaflets typically long-acuminate and/or with the terminal leaflet typically somewhat larger than the lateral leaflets.

Leaves densely long-pilose on the upper surface. *S. violaceimarmoratum.*

Leaves subglabrous to sparsely pubescent or puberulent on the upper surface.

Pedicels articulate at about or below the middle; calyx-lobes shortly apiculate. . . . . *S. santolallae.*

Pedicels articulate within about 5 mm. of calyx; calyx-lobes linear-acuminate. . . . . *S. acroscopicum.*

Leaflets typically acute or shortly acuminate; terminal leaflet about the same as or larger than the lateral leaflets. *S. ayacuchense.*

Solanum acroscopicum Ochoa, Agronomía (Lima) 18, No. 74: 130, Figs. 3–4. 1953 (reprint pp. 16, 17, and 20, Figs. 3–4). *Figure 29.*

FIG. 29. *Solanum acroscopicum* Ochoa. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

In the mountains of southern Peru at 3,450 m. alt.

Plant up to 6.5 dm. tall, stoloniferous and tuber-bearing, essentially glabrous throughout or lightly puberulent; tubers elongate, subcylindrical, white, up to 7 cm. long and 4 cm. in diameter; stem simple to moderately branched, somewhat sinuous, pale green to pigmented near base; leaves odd-pinnate, up to 22 cm. long, shortly petiolate, usually with few to numerous several-sized interstitial leaflets; leaflets 9 or 11, shortly petiolulate and occasionally with a minute secondary leaflet on the acroscopic side of the petiolule, lanceolate, acuminate or narrowly acute, up to 7 cm. long and 2.5 cm. wide; lateral leaflets somewhat oblique; pseudostipular leaves broadly lunate, up to 2 cm. long; inflorescence pseudoterminal, cymosely paniculate, with up to 20 or more showy flowers; peduncle stout, up to 7 cm. long, shortly branched above; pedicels slender, 2–4 cm. long, articulate within 5 mm. of the calyx; flowers pale violet-color to violet-purple; calyx 6–8 mm. long, divided to below the middle into lobes that are broadly ovate below then abruptly constricted above to form a narrowly linear acuminate apical portion; corolla large, broadly rotate-pentagonal, 3–4 cm. in diameter; anthers narrowly lanceolate in outline, 5.5–6.5 mm. long; filaments 1.5–2 mm. long; style 10–12 mm. long, the stigma only slightly thickened; fruit oval, bright green and white spotted.

This species appears to form a rather close alliance with *S. santolallae* and *S. laxissimum* and its f. *Rockefelleri*. The long calyx-lobes, in part, separate it from *S. santolallae*, and its interstitial leaflets and differently shaped corolla separate it from *S. laxissimum*.

Moquegua: Carumas, *Weberbauer 7304*.—Tacna: Dept. Tarata, Chivateria, above Tacna, 3,450 m. alt., *Ochoa 2043*.

Solanum ayacuchense Ochoa, Agronomía (Lima) 26:312, Figs. 1959. *Figure 30.*

Plant spreading-decumbent to erect, up to 7 dm. tall, stoloniferous and tuber-bearing, lightly short-pilose to puberulent throughout; tubers whitish, oval to ellipsoid, up to 10 cm. long, with numerous lenticels; stem branched, lightly winged and somewhat sinuous, pigmented, up to 1 cm. thick; leaves odd-pinnate, up to 20 cm. long, shiny on the upper surface, without or usually with one or more interstitial leaflets; petiole 2–4 cm. long; leaflets 7 to 11, usually 9, prominently petiolulate (the petiolule 0.5–2 cm. long), ovate-elliptic to elliptic or elliptic-lanceolate, rounded to somewhat truncate at the oblique base, acute to shortly acuminate at apex, up to 5.5 cm. long

FIG. 30. *Solanum ayacuchense* Ochoa. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3; 6, fruit, × ½.

FIG. 31. *Solanum Buesii* Vargas. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3; 6, fruiting inflorescence, × ½.

and 2.8 cm. wide; terminal leaflet sometimes slightly larger than the lateral ones; pseudostipular leaves minute, sublunate, less than 5 mm. long, sometimes lacking or obsolescent; inflorescence pseudoterminal and/or lateral, up to 10-flowered; peduncle somewhat pigmented, 5–7.5 cm. long, branched above; pedicels 1.2–1.5 cm. long, pigmented, articulate below the middle, with development of fruit noticeably thickened above the articulation; flowers pale violet-color, usually with a white star in center; calyx 5 mm. long, divided to about the middle into ovate to ovate-subquadrate apiculate lobes, pigmented; corolla rotate-pentagonal, about 2 cm. in diameter; anthers lanceolate in outline, 5 mm. long; filaments 0.5–1 mm. long, pubescent; style 6.5–7 mm. long, lightly cellular-papillose below; fruit pale green, ovoid-conical, cuspidate, up to 2.5 cm. long and 1.5 cm. thick.

The long-petioluled leaflets that are often broadly and shortly elliptic give this plant a distinctive appearance in the series Conicibaccata. As the fruit develops the pedicel above the articulation becomes noticeably thicker than the part below the articulation. The pseudostipular leaves are greatly abbreviated and sometimes entirely lacking.

Ayacucho: Prov. de La Mar, Yanta Yanta, 3,000 m. alt., *Ochoa 2150.*

Solanum Buesii Vargas, Rev. Argentina Agron. 10: 396. 1943; "Rev. Universitaria," Cuzco, No. 84: 16, Fig. 1. 1943; Las Papas Sudperuanas, Part I (Pub. 1, Univ. Nac. Cuzco): 85, Fig. 31. 1949. *Figure 31.*

In granitic soils of mountain areas, 2,400–3,600 m. alt. Southern Peru.

Plant up to 7 dm. tall, more or less coarsely pilose throughout, stoloniferous and tuber-bearing; tubers numerous, globose, white and rose-tinted; stem robust, purple-mottled; leaves odd-pinnate, up to 25 cm. long, coarsely and densely pubescent on both surfaces, with several small, oval, interstitial leaflets; leaflets 5 or mostly 7, sometimes with another minute pair at base, with petiolules up to 5 mm. long or with the upper pair sessile, lanceolate, acute to long-acuminate, obliquely rounded to cuneate at base, up to 8.5 cm. long and 3 cm. wide, the terminal leaflet sometimes slightly larger than the lateral ones; pseudostipular leaves semiovate, falcate, up to 1.5 cm. long; inflorescence pseudoterminal or lateral, multiflowered, broadly cymose; peduncle up to 10 cm. long, pubescent; pedicels up to about 2 cm. long, densely whitish pubescent, articulate about the middle;

flowers bluish purple; calyx up to 9 mm. long, usually bilabiate (that is, the calyx is divided to near the base into two parts, with one pair of lobes forming one lip and the other three lobes forming the opposite lip), otherwise divided into ovate-lanceolate abruptly acuminate to apiculate lobes, provided with long white setaceous hairs; corolla rotate-stellate, up to about 4 cm. in diameter, the petal-acumens up to 1 cm. long and coarsely pubescent at their tips; anthers up to 8 mm. long, oblong-lanceolate in outline; filaments broad, about 2 mm. long, sparingly pubescent; style about 1 cm. long, minutely papillose below the middle, the stigma subglobose; fruit conical, purple-spotted, up to 3.5 cm. long.

The conspicuously pilose-setaceous calyx, which is usually strongly bilabiate, and showy rotate-stellate corolla are characteristics that distinguish this species. It is apparently closely related to *S. laxissimum* and, to some extent, to *S. violaceimarmoratum*.

Cuzco: Torontoy, Urumbamba Valley, 3,000 m. alt., *Bingham 556*. Torontoy, Urubamba Valley, 2,400 m. alt., *Bingham 722*. Prov. Urubamba, Puyupata, granitic soil, ancient ruins, 3,600 m. alt., *Vargas C. 2877*.

Solanum claviformum Corr., Wrightia 2: 174. 1961. *Figure 32*.

Plant slender, lax, up to 1 m. tall, completely glabrous throughout; tubers (if present) unknown; stem slender, stramineous, terete; leaves odd-pinnate, lax, up to 17 cm. long, without or sometimes with one or several interstitial leaflets; leaflets 9 or 11; lateral leaflets essentially sessile to slender-petiolulate, lanceolate, rounded at the oblique base, acuminate at apex, up to 5 cm. long and 1.5 cm. wide; terminal leaflet similar to the lateral ones; pseudostipular leaves semielliptic, falcate, less than 1 cm. long; inflorescences pseudoterminal and/or lateral, cymosely paniculate, about 12-flowered; peduncle slender, stramineous, up to 11 cm. long; pedicels 1.5–2 cm. long, conspicuously articulate well below the middle to near the base or very rarely to just below the middle, gradually dilated above the articulation to form a slender club that is sometimes minutely warty; flowers purple; calyx about 4 mm. long, divided to about the middle into ovate-subquadrate apiculate lobes; corolla rotate-stellate, 2–2.5 cm. in diameter; anthers about 5 mm. long, linear-oblong in outline, with a basal dorsal central lobule; filaments 1 mm. long, glabrous, united at base; style 6–7 mm. long, cellular-papillose below the middle, fruit unknown but the ovary is ovoid.

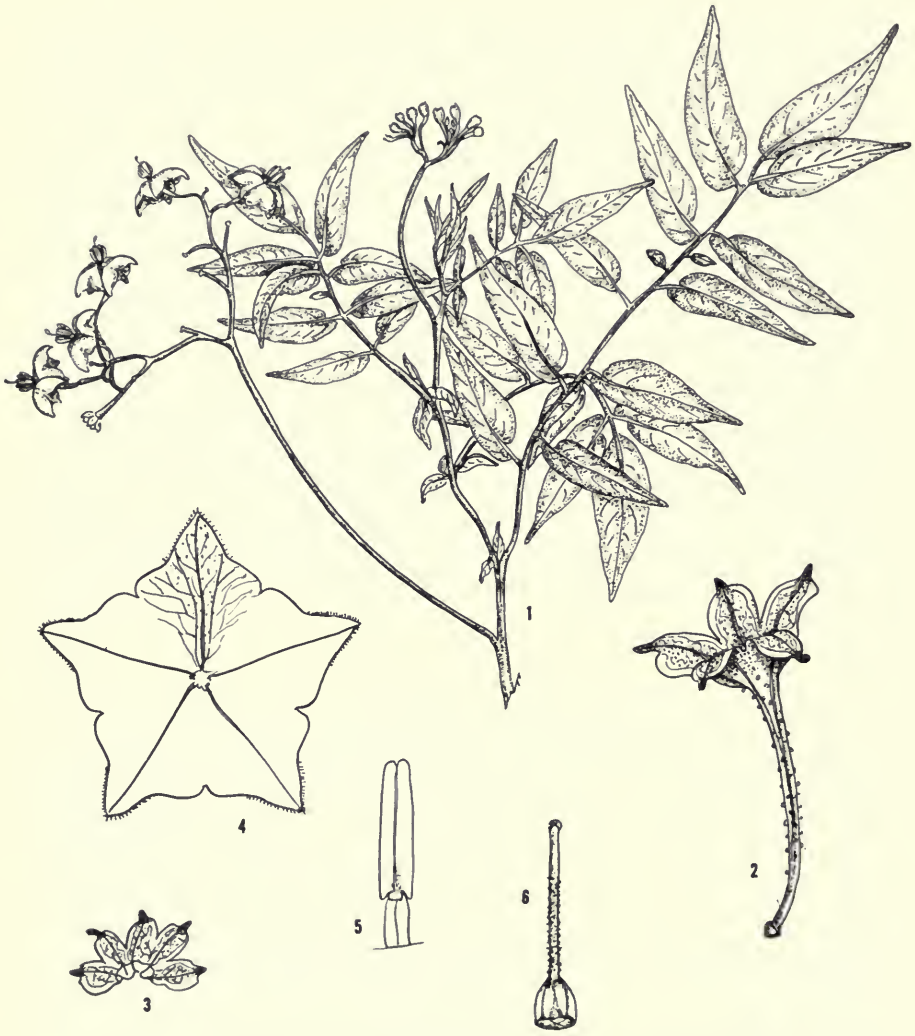

FIG. 32. *Solanum claviformum* Corr. 1, upper part of flowering plant, × ½; 2, calyx and claviform pedicel, × 3; 3, calyx, spread out, × 1½; 4, corolla, spread out, × 1½; 5, stamen, dorsal view, × 3; 6, pistil, × 3.

This is a lax plant with conspicuously wide-spreading, mostly lateral, inflorescences and low pedicel-articulations. The portion of the pedicel above the articulation is noticeably dilated into the calyx to form a slender, often warty, club.

Huánuco: Carpish, Km. 60 between Huánuco and Tingo María. *Swingle 66*.

FIG. 33. *Solanum huancabambense* Ochoa. 1, flowering plant, × ½; 2, calyx, spread out, × 1; 3, corolla, spread out, × 1; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

Solanum huancabambense Ochoa, Agronomía (Lima) 26: 109, Figs. 1959. *Figure 33.*

Plant erect-ascending, up to 4 dm. tall, stoloniferous and tuber-bearing; tubers globose to oval, yellowish white, 3–5 cm. long, the eyes superficial, with numerous lenticels; stem narrowly winged, 3–4 mm. thick; leaves odd-pinnate, up to 15 cm. long, without or with several small interstitial leaflets, glabrous to subglabrous and vernicose on the dark green upper surface, grayish green and sparsely pilose on the lower surface; leaflets 7 or 9; lateral leaflets sessile to shortly petiolulate, ovate to ovate-elliptic or elliptic, noticeably oblique at the rounded base and sometimes sub-auriculate on the basiscopic side, obtuse at apex, up to 5 cm. long and 2 cm. wide; terminal leaflet slightly larger than the lateral ones; pseudostipular leaves semi-orbicular, lunate, about 1 cm. long; inflorescence pseudo-terminal, up to 15-flowered; peduncle up to 12 cm. long, glabrous, pigmented, rather stout, branched above; pedicels up to 3.5 cm. long, articulate well above the middle or just below the calyx, glabrous; flowers yellowish white; calyx greenish, 5.5–7 mm. long, usually sparsely pilose with long lax hairs, divided to about or below the middle into triangular-ovate acuminate lobes; corolla broadly rotate-stellate to subrotate, 2.5–3.5 cm. in diameter, the lobes triangular-ovate; anthers lanceolate in outline, 5–6 mm. long; filaments about 1.5 mm. long, broad, glabrous; style about 9 mm. long, minutely cellular-papillose below the middle, the stigma capitate; fruit (immature) conical.

Piura: Prov. Huancabamba, Juzgarda in vicinity of Huancabamba, 2,000 m. alt., *Ochoa 2023.*

Solanum laxissimum Bitt., Engl. Bot. Jahrb. 54, Beibl. 119: 7. 1916. *Figure 34.*

On the edge of forests, 2,100–3,100 m. alt. Central Peru to Bolivia.

Plant up to 5 m. or more tall, laxly ascending, probably tuber-bearing; tubers unknown; stem rather stout, 5–6 mm. in diameter on lower part; internodes elongate, up to 12 cm. long; leaves odd-pinnate, up to 40 cm. long (including the petiole), sparsely pubescent to glabrescent above, grayish-glaucous and finely pubescent along the veins beneath, with or without very few interstitial leaflets; leaflets 9 or 11, with petiolules up to 2.5 cm. in length, narrowly lanceolate to elliptic-lanceolate, long-acuminate to attenuate at apex, obliquely rounded to cuneate at base, up to 11 cm. long and 4.5 cm. wide, the terminal leaflet rarely somewhat broader than the lateral

FIG. 34. *Solanum laxissimum* Bitt. 1, average size leaf, × ½; 2, inflorescence, × ½; 3, calyx, spread out, × 2; 4, corolla, spread out, × 1; 5, stamen, dorsal view, × 3; 6, pistil, × 3.

ones; pseudostipular leaves obliquely ovate, acute to acuminate, up to 2 cm. long; inflorescence pseudoterminal and/or lateral, several-branched, with as many as 30 flowers; peduncle slender, up to 11 cm. long, glabrous to puberulent, branched above; pedicels slender, 1.5–1.7 cm. long or up to 3.5 cm. long (in f. *Rockefelleri*), glabrous to puberulent, articulate below the middle or near the base, rarely above the middle (in f. *Rockefelleri*); flowers usually large, violet-color; calyx 4.5–8 mm. long, glabrous, usually divided to about the middle into broadly ovate to ovate-elliptic somewhat apiculate or shortly acuminate scarious-margined lobes, sometimes bilabiate; corolla rotate-stellate, 2–4 cm. in diameter, the triangular-lanceolate acumens 6–10 mm. long; anthers 6–8 mm. long, oblong-lanceolate in outline; filaments broad, about 1 mm. long, usually slightly pubescent (especially on the edges); style 7–9.5 mm. long, slender, usually scarcely exceeding the stamens, minutely cellular-papillose near base, the stigma globose; fruit ovoid-ellipsoid, 1.5 cm. or more long.

This is a plant that is large in all its parts. It is essentially glabrous or glabrescent throughout, and the leaves have few, if any, scattered interstitial leaflets. The slender pedicel is distinctive in that it is articulate near the base. The large rotate-stellate corolla is quite similar to that of *S. Buesii*.

Solanum laxissimum is closely allied to several species that center about *S. violaceimarmoratum*. The long narrowly lanceolate acuminate leaflets, with rounded to narrowly cuneate bases, however, superficially distinguish it from these allied species.

Junín: Río Masamerich, 3,100 m. alt., *Weberbauer 6640*.

Solanum laxissimum f. **Rockefelleri** (Vargas) Corr., Wrightia 2: 175. 1961. *S. Rockefelleri* Vargas, Las Papas Sudperuanas, Part II (Publ. Univ. Nac. Cuzco): 54, Fig. 7. 1956 (as *S. Rockefelleriae*).

The longer pedicel, with its high articulation, and the smaller corolla distinguish this plant from typical *S. laxissimum*. From *S. santolallae* it is distinguished by the differently shaped corolla and the high articulation of the pedicels.

Huánuco: Carpiste Divide, sub-shrub growing in the rain-forest, 2,750 m. alt., *Sandeman 5148*.—Cuzco: Urubamba, Machu Picchu, 2,100 m. alt., edge of woods, *Vargas C. 5548*.

Solanum limense Corr., Wrightia 2: 188. 1961. *Figure 35*.

Plant lax, 3 dm. or more tall, probably tuber-bearing, glabrous throughout except for sparse pubescence on both surfaces of the leaf-

FIG. 35. *Solanum limense* Corr. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

lets; tubers unknown; stem slender, glabrous, branched; leaves odd-pinnate, slender, lax, usually with several small stalked orbicular interstitial leaflets, up to 17 cm. long; leaflets 9 or 11, with prominent slender naked petiolules up to 5 mm. long; lateral leaflets elliptic, obtuse to abruptly long-acute at apex, broadly rounded to somewhat cordate at the oblique base, up to 3.5 cm. long and 1.5 cm. wide; terminal leaflet usually a little broader and larger than the lateral ones; pseudostipular leaves semi-ovate, falcate, about 8 mm. long; inflorescence pseudoterminal or lateral, cymosely paniculate, glabrous, about 15-flowered; peduncle slender, about 7 cm. long, branched above; pedicels slender, 1–2 cm. long, glabrous, articulate at about the middle; flowers apparently whitish (not noted); calyx 2.5–4 mm. long, divided to about the middle into subquadrate short-apiculate lobes; corolla stellate, 2–2.5 cm. in diameter, the acumens prominent; anthers linear-oblong in outline, 4–6 mm. long; filaments glabrous, about 1 mm. long; style slender, glabrous, about 1 cm. long, the stigma elongate-cylindric; fruit unknown but the ovary ovoid.

Except for the fewer interstitial leaflets, the leaves of this species resemble somewhat those of *S. Abbottianum*. It is, however, a more lax, weak plant, being slender throughout. This species has several distinctive features. It is glabrous except for a thin pubescence on both surfaces of the leaflets, the corolla is stellate, and the calyx is minute.

This species is closely allied to *S. huancabambense*. It differs from that species, however, in its glabrous, smaller calyx, smaller and more-deeply and narrowly lobed corolla, elongate-cylindric instead of capitate stigma, and lower pedicel-articulation.

Lima: Jan. 1948, *Soukup 3555*.

Solanum pillahuatense Vargas, Las Papas Sudperuanas, Part 1 (Publ. Univ. Nac. Cuzco): 90, Fig. 35. 1949 (without Latin diagnosis); Part II: 53. 1956. *Figure 36*.

Plant weakly erect-ascending, up to 6 dm. tall, more or less pilose throughout, probably tuber-bearing; tubers unknown; stem slender, purple-spotted; leaves odd-pinnate, up to 17 cm. long, with a petiole 3.5–7 cm. long, the petiole and rachis usually narrowly winged, apparently without interstitial leaflets; leaflets 5, rarely 3 or 7, sessile or shortly petiolulate with the petiolule mostly narrowly winged and decurrent on the leaf-rachis, ovate to broadly elliptic or elliptic-lanceolate, rounded to broadly cuneate at the oblique base, obtuse to shortly acuminate at the apex, up to 6.5 cm. long and 3 cm. wide,

FIG. 36. *Solanum pillahuatense* Vargas. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

the terminal leaflet slightly larger than the uppermost pair of lateral leaflets; pseudostipular leaves narrowly lunate, less than 1 cm. long; inflorescence pseudoterminal and/or lateral, cymosely paniculate, up to 15-flowered; peduncle slender, up to 7 cm. long, densely pilose, branched above; pedicels up to 2.5 cm. long, densely pilose, articulate at about the middle, conspicuously glandular above the articulation; flowers violet-blue; calyx 6–7 mm. long, divided to about or below the middle into oblong-quadrate apiculate lobes, densely pilose with coarse hairs; corolla rotate-stellate, 2–2.8 cm. in diameter, the acumens prominent; anthers 7 mm. long, narrowly oblong in outline; filaments about 1 mm. long, glabrous; style 9–10 mm. long, papillose below the middle; fruit oval and conical, acute, up to 1.5 cm. long.

This species is superficially similar to the related *S. Flahaultii* of Colombia. Besides some floral differences, however, the pedicel is articulate at about the middle and is noticeably glandular above the articulation.

Cuzco: Prov. Paucartambo, between Paso de Aguila and Pillahuata, edge of moist rocky mountain forest, 2,800 m. alt., *Vargas C. 4924*.

Solanum santolallae Vargas, Rev. Argentina Agron. 10: 397. 1943; Las Papas Sudperuanas, Part I (Publ. Univ. Nac. Cuzco): 87, Fig. 32. 1949. *S. santolallae* var. *acutifolium* Vargas, Rev. Argentina Agron. 10: 397. 1943; Las Papas Sudperuanas, Part I (Publ. Univ. Nac. Cuzco): 87, Fig. 33. 1949. *Figure 37*.

In loose gravelly soil on open slopes, in thickets, rain-forests, cut-over woodlands and along streams, 2,500–3,600 m. alt. Central and southern Peru.

Plant up to 9 dm. tall, essentially glabrous throughout or only sparsely pilose or (in f. *velutinum*) velvety, stoloniferous and tuber-bearing; tubers numerous, oval, whitish and superficially tinged with violet-color; stem slender, sometimes mottled with purple; leaves odd-pinnate, up to 35 cm. long, usually long-petioled, subglabrous to sparsely pubescent on both surfaces, often suffused with purple, with or without only several small elliptic interstitial leaflets; leaflets 7 to 11, commonly with petiolules up to 7 mm. long, elliptic-lanceolate to lanceolate, narrowly acute to acuminate-attenuate, obliquely rounded at base, up to 11.5 cm. long and 3.5 cm. wide, the terminal leaflet occasionally larger than the lateral ones; pseudostipular leaves obliquely ovate, obtuse, up to 1.5 cm. long; inflorescence pseudoterminal or lateral, cymose, about 8-flowered; peduncle stout, glabrous,

FIG. 37. *Solanum santolallae* Vargas. 1, upper part of flowering and fruiting plant, × ½; 2, inflorescence, × ½; 3, leaf from lower part of branch, × ½; 4, calyx, spread out, × 1½; 5, corolla, spread out, × 1½; 6, stamen, dorsal view (note papillose anther), × 3; 7, pistil, × 3.

up to 15 cm. long; pedicels up to 2 cm. long, glabrous, articulate about or below the middle, swelling into the calyx; flowers white, violet-tinged; calyx 4.5–6 mm. long, glabrous or with a few prominent hairs, usually very shallowly lobed or divided to about or below the middle into ovate-triangular to ovate-elliptic rounded-apiculate lobes; corolla rotate-pentagonal to shallowly rotate-stellate, 1.8–2.5 (rarely up to 3) cm. in diameter; anthers 4–7 mm. long, oblong-lanceolate in outline, granular-papillose; filaments broad, glabrous or sparsely pubescent, about 2 mm. long; style 5–8 mm. long; the stigma slender; fruit ovoid-conic, to about 2.5 cm. long, somewhat tinged with violet-color.

Except for the smaller, basically rotate-pentagonal, instead of deeply rotate-stellate, corolla and the more shallowly lobed calyx, this species might be referred to *S. laxissimum*. Vegetatively, it (especially the plant described as var. *acutifolium*) closely resembles that species. In the shape of its calyx-lobes it resembles *S. violaceimarmoratum* but the narrower leaflets and essentially glabrous condition throughout distinguish it from that variable species.

Cuzco: Prov. Urubamba, grassy soil, Machu Picchu, 2,600 m. alt., *Carillo & Ross 862*. Prov. Urubamba, Machu Picchu, Quebrada de Baños Jesús, in rain-forest, 2,650 m. alt., *Carillo & Ross 863*. Cerro de Cusilluyoc, thicket in valley of páramo above "Pillahuata," 3,000–3,300 m. alt., *Pennell 14117*. Prov. Paucartambo, Pillahuata, in woods, 3,100 m. alt., *Vargas C. 54*. Prov. Convención, "El Dorado," 2,900 m. alt., *Vargas 3504*. Prov. Convención, "El Dorado," Alturas de Pintobamba, in cut-over woodlands, 2,900 m. alt., *Vargas 3505*. Prov. Paucartambo, Acjanacu-Pillahuata, in loose soil and rocks on slope, *Vargas 3652*. Prov. Urubamba, "Huinuhaina," in mountains above, *Vargas 4146*. Prov. Paucartambo, Pillahuata, open rocky slope, 2,700 m. alt., *Vargas 5109a*.—Huánuco: Prov. Huánuco, Carpish, thicket, 2,700 m. alt., *Asplund 12818*. Between Huánuco and Pampayuca, east Andes, *Kanehira 293*. Piedras Grandes, along moist clearings and path in sunny situations, 3,000 m. alt., *Woytkowski 148*.—Junín: Prov. Tarma, Chauchamayo Valley, above La Merced on Cumbre Yacunay near summit, about 2,500 m. alt., *Hutchison 1181*.

Solanum santolallae f. **velutinum** Corr., Wrightia 2: 176. 1961.

In habit and general characteristics this plant is similar to typical *S. santolallae*. However, instead of being essentially glabrous or at

most sparsely pubescent, f. *velutinum*, as the name implies, has a dense covering of velvety hairs.

Cuzco: along stream near Machu Picchu railway station, *Correll & Smith P261*.

Solanum violaceimarmoratum Bitt., Repert. Sp. Nov. 11: 389. 1912. *S. urubambae* Juz., Bull. Acad. Sci. U.R.S.S., ser. Biol. 2: 312. 1937. *S. violaceimarmoratum* var. *papillosum* Hawkes, Bull. Imp. Bur. Pl. Breed. & Genet., Cambridge 12, 14, 113. 1944. *S. neovargasii* Ochoa, Los Solanum Tuberiferos Silvestres del Perú 53, fig. 16. 1963 (dated 1962) (type: Peru, Dept. Junín, Prov. Tarma, Culumachay, Quebrada del Río Vitoc, 2,800 m. alt., subtropical mountain forest, Jan. 28, 1961, *C. Ochoa 2343*). *Figure 38*.

In shrubby areas or in forests, occasionally in open country, 1,800–3,600 m. alt. Southern Peru and Bolivia.

Plant up to 3 m. tall, usually much smaller, stoloniferous and tuber-bearing; tubers oval or broadly ellipsoid, yellowish or whitish, up to 4 cm. or more long; stem slender, ascending, flexuous, up to about 8 mm. thick below the middle, often marbled with purple, wingless, more or less puberulent to essentially glabrous; leaves odd-pinnate, 10–32 cm. long, with or without several interstitial leaflets, pubescent on the upper surface with coarse or slender usually shiny hairs, more densely but finely pubescent on the lower surface, often long-petiolate; leaflets 3 to 9, mostly 5 or 7, usually with slender petiolules up to 1.5 cm. long, ovate to ovate-lanceolate or elliptic-lanceolate to broadly lanceolate, more or less abruptly acute to acuminate and often attenuate at the apex, rounded to truncate or lightly cordate at the oblique base, up to 12 cm. long and 6 cm. wide, usually much smaller; terminal leaflet commonly wider than the lateral leaflets; pseudostipular leaves semi-ovate, falcate, up to 2.5 cm. long; inflorescence pseudoterminal and/or lateral, sometimes diffusely branched with the branches wide-spreading, usually many-flowered; peduncle stout, up to 11 cm. long, subglabrous to puberulent or pubescent with spreading hairs, often conspicuously branched above; pedicels 1.5–2 cm. long, subglabrous to glandular-puberulent, articulate about or somewhat below the middle, typically gradually and noticeably dilated into the calyx; flowers bright blue-purple to rich violet-color; calyx 5–9 mm. long, divided to about the middle into broadly rounded to ovate abruptly apiculate to acuminate lobes, often tinged or mottled with purple, essentially glabrous to densely short-pilose or glandular-puberulent, commonly bilabiate; corolla

FIG. 38. *Solanum violaceimarmoratum* Bitt. 1, upper part of flowering plant and tuber, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3; 6, part of fruiting branch, × ½; 7, leaf, × ½.

rotate-pentagonal to somewhat rotate-substellate, 2–3.5 cm. in diameter, with the acumens up to about 6 mm. long and sometimes prominent; anthers linear to narrowly lanceolate in outline, 4–7 mm. long; filaments 1–2 mm. long, rather broad, glabrous to conspicuously pubescent; style 7–12 mm. long, glabrous to puberulent on the lower half, with the stigma short and thickened; fruit ellipsoid-conical, elongated, up to 2.5 cm. long.

In the type material of *S. violaceimarmoratum* that I have examined, which does have fully developed flowers, the style and filaments are glabrous. The lack or occurrence of pubescence on the style and filaments does not appear to be too reliable or constant a characteristic in this species. In the material cited here some of the plants have flowers with both their styles and filaments entirely glabrous or they may have those organs papillose and pubescent, respectively, while others may have a papillose style and glabrous filaments.

Cuzco: Prov. Urubamba, Cedrobamba, Km. 101, very damp soil of valley, associated with *Solanum ochranthum*, etc., about 2,000 m. alt., *Carillo, Perez, Rimpau & Ross 886*. Prov. Urubamba, between Santa Rita and Ckellomayo, stony places, *Juzepczuk 10973*. Prov. Urubamba, Salapuncu, rocky places, 2,500 m. alt., *Vargas C. 8107*.

Series 9. MINUTIFOLIOLA

Minutifoliola Corr., The Potato and its Wild Relatives 216.1962.

Plants large and coarse, densely pilose throughout, sometimes glandular, stoloniferous and tuber-bearing or giving rise directly to new plants; leaves odd-pinnate, trifoliate in aspect; leaf-rachis and petiole typically provided with numerous often somewhat subimbricate interstitial leaflets; pedicels articulate at about or above the middle; corolla rotate to stellate; fruits globose.

The dense pilosity, 3-leaflet aspect of the leaves, and the usually numerous interstitial leaflets are characteristics that distinguish this series.

From central Ecuador to northern Peru.

Solanum cajamarquense Ochoa, Agonomía (Lima) 26, no 4: 314, Figs. 1959. *Figure 39*.

On talus slopes, around 2,600 m. alt. Northern Peru.

Plant erect or erect-ascending, up to 9 dm. tall, usually 5 dm. or less tall, stoloniferous and tuber-bearing, more or less long-pilose

throughout (sometimes densely so); tubers globose to ellipsoid, white, 1–1.5 cm. long; stem simple or branched, usually somewhat zigzag, 6–9 mm. thick; leaves odd-pinnate, bright yellowish green, up to 19 cm. long, provided with few to many interstitial leaflets; leaflets 5 or usually 7, the margins undulate-crenate; lateral leaflets sessile, broadly elliptic-lanceolate to ovate-lanceolate, abruptly acute to short-acuminate at apex, broadly rounded to basiscopically auriculate at base or sometimes decurrent on the leaf-rachis, up to 7.5 cm. long and 4.5 cm. wide; terminal leaflet usually much larger than the adjacent pair of lateral leaflets, broadly elliptic-ovate to suborbicular, subobtuse to abruptly acuminate at apex, broadly rounded at base; pseudostipular leaves semi-orbicular, lunate, up to 2 cm. long; inflorescence pseudoterminal on the branches and/or lateral, many-flowered; peduncle up to 10 cm. long, branched above, usually densely pilose with long whitish paleaceous hairs; pedicels 1.5–2.5 cm. long, articulate just above the middle or to within about 5 mm. of the calyx, densely pilose; flowers white or creamy-white; calyx fleshy-thickened, 7–8 mm. long, divided to about or below the middle into ovate abruptly long-acuminate fleshy lobes that are somewhat channeled on the inner surface, mostly densely pilose; corolla rotate-pentagonal to rotate-substellate, 2.5–3 cm. in diameter; anthers lanceolate in outline, 6–6.5 mm. long; filaments slender, glabrous, about 1 mm. long; style about 1 cm. long, cellular-papillose on the lower half, the small stigma globose; fruit globose, bright green and mottled, 1–1.5 cm. in diameter.

This is a coarse plant that is heavily invested, especially the stem and inflorescence, with long coarse whitish paleaceous hairs. The large terminal leaflet and somewhat smaller adjacent pair of lateral leaflets give to the plant a 3-leaflet appearance, although this is not the case. Their margins are also strongly undulate-crenate and often give the appearance of being pleated.

Cajamarca: on talus slope 29 km. from Cajamarca on road to Chilete, 2,650 m. alt., *Correll & Smith P848*. Lanchi, near Chiquidén, by way of San Juan to Paso del Gavilán, 2,600 m. alt., *Ochoa 1490*.

Series 10. VAVILOVIANA

Vaviloviana Buk. ex Buk. & Kameraz, Bases of Potato Breeding 18. 1959.

Plants bushy and herbaceous, stoloniferous and tuber-bearing, densely glandular-pilose and heavy with the odor suggesting *Lyco-*

FIG. 39. *Solanum cajamarquense* Ochoa. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3; 6, fruits, × 1.

persicon (tomato); leaves odd-pinnate or sometimes odd-bipinnate; pedicels articulate above the middle; corolla rotate, purplish to pale violet-color; fruits globose.

Apparently endemic to the loma vegetation zone of coastal Peru.

Solanum Wittmackii Bitt., Repert. Sp. Nov. 12: 54. 1913. *S. Wittmackii* var. *glauciviride* Bitt., Repert. Sp. Nov. 12: 56. 1913. *S. Vavilovii* Juz. & Buk., Bull. Acad. Sci. U.R.S.S., ser. Biol. 2: 302. 1937. *Figures 1, 40.*

Among rocks in the loma region of coastal Peru, from near sea level up to 500 m. alt.

Plant erect or ascending, up to 7.5 dm. or more tall, tuber-bearing, white-pilose and more or less glandular-stipitate throughout, odoriferous of *Lycopersicon;* tubers globose to ellipsoid or cylindric, up to 3 cm. or more long; stem rather stout, flexuous, leafy; leaves odd-pinnate to odd-bipinnate, 1–3.5 dm. long, the petiole up to 3 cm. long, with numerous several-sized often somewhat recurved interstitial leaflets; leaflets 11 to 15, sessile or shortly petiolulate, narrowly lanceolate to elliptic-lanceolate or ovate-lanceolate, tapering to a narrowly obtuse to acute or acuminate apex, rounded to cuneate at the oblique base, up to 8.5 cm. long and 3.5 cm. wide, mostly much smaller; lateral leaflets only slightly smaller (if at all) than the terminal leaflet, rarely with several well-developed secondary leaflets; pseudostipular leaves broadly lunate, falcate, 1–2 cm. long; inflorescence pseudoterminal, cymosely paniculate, several- to many (24)-flowered; peduncle rather stout, up to 9 cm. long, widely branched above; pedicels 2–3 (rarely more) cm. long, prominently articulate well above the middle; flowers purple to pale lilac-color, showy; calyx 6–11 mm. long, lightly pilose, divided to near the base into ovate lobes that are usually abruptly constricted above into linear to linear-lanceolate or narrowly spatulate elongate lobules; corolla rotate, 2.5–3.5 (rarely more) cm. in diameter; anthers oblong-lanceolate in outline, 5.5–7 mm. long; filaments broad, 1–1.6 mm. long, glabrous, commonly united about midway to apex; style 9–13 mm. long, mostly recurved near the apex, minutely cellular-papillose below the middle, the stigma slender-clavellate or cylindric and commonly cleft; fruit globose, about 2 cm. in diameter.

The stipitate glands that give to the plant the odor of species of *Lycopersicon,* the peculiarly elongate calyx-lobes, rotate corolla, and much-dissected leaves are a combination of characteristics that distinguish this species.

FIG. 40. *Solanum Wittmackii* Bitt. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, showing united filaments, × 3; 5, pistil, × 3; 6, section of peduncle and pedicel to show glands, much enlarged.

Lima: western base of mountains, Amancaes near Lima, about 30 m. alt., *André 4114*. Lima, *Barranca 208 p.p.* Cerro de Chancay, *Esposta 57*. Lomas de Amancaes, near Lima, argillaceous, brow of mountains, 200–250 m. alt., *Ferreyra 6264*. Lomas de Amancaes, near Lima, rocky ground, 300–350 m. alt., *Ferreyra & Hjerting 14148*. San Geronimo, rock slide, 155 m. alt., *Macbride 5800*. In Amancaes, *Martinet 332 (984)*. Lomas of Amancaes, amongst rocks, *Mathews 847 p.p.* Escuela Nac'l de Agricultura (cultivated), 210 m. alt., *Mexia 4073 p.p.* Lomas de Amancaes, among rocks, 250 m. alt., *Ochoa 590*. Lomas de Amancaes, near Lima, 250 m. alt., *Ochoa 1805*. Growing in full exposure among other Lomas plants, 460 m. alt., *Sandeman 156*. Amancaes Valley, loma, 215 m. alt., *Sandeman 4338*. Amancaes, rocky places, 200–500 m. alt., *Vargas C. 9645*. Tubers collected in loma region near Chorillos (specimen obtained from plants grown near Leningrad), *Vavilov & Weberbauer s.n.*—Lima, *Wawra 2533*. Mountains of Amancaes near Lima, 250–300 m. alt., *Weberbauer 5705*.—Indefinite: received Dec. 27, 1878, *Martinet 514*. 1944, *Soukup 1614*.

Series 11. MEGISTACROLOBA

Megistacroloba Cárd. & Hawkes, Jour. Linn. Soc., Bot. 53: 93. 1945.

Usually small bushy or spreading plants with an abbreviated or rarely elongate stem, stoloniferous and tuber-bearing; leaves odd-pinnate to odd-pinnatifid or sometimes simple, rarely with interstitial leaflets; terminal leaflet mostly conspicuously larger than the lateral leaflets (when these are present); lateral leaflets mostly broadly decurrent on the leaf-rachis on the basiscopic side; peduncle often much-abbreviated; pedicels articulate well above the middle and often near the calyx; corolla rotate to broadly stellate; fruits globular to broadly ovoid.

From northern Peru, southward through Bolivia to northwest Argentina.

Leaves simple or with only a solitary pair of minute lateral leaflets.
Terminal leaflet acute; leaves halberd-shaped . . . . . *S. hastiformum.*
Terminal leaflet rounded to obtuse, not acute; leaves not halberd-shaped.
Midrib of leaf or leaflets on upper surface usually densely fine-pilose . . . . . *S. toralapanum* var. *subintegrifolium.*
Midrib of leaf or leaflets on upper surface glabrous or subglabrous . . . . . *S. megistacrolobum.*

Leaves (at least some) with one or more pairs of well-developed lateral leaflets.

Terminal leaflet rhombic-ovate.....*S. dolichocremastrum.*

Terminal leaflet not rhombic-ovate.

Distribution north-central Peru.

Corolla broadly stellate; only the upper pair of lateral leaflets well-developed.....*S. chavinense.*

Corolla rotate; usually with two or more pairs of lateral leaflets well-developed.....*S. sogarandinum.*

Distribution southern Peru.

All of the lateral leaflets broadly sessile and usually conspicuously decurrent on the leaf-rachis.

Uppermost pair of lateral leaflets (on some leaves) usually nearly one-half as large as the terminal leaflet.

S. Hawkesii.

Uppermost pair of lateral leaflets usually less than one-third as large as the terminal leaflet.

Midrib of leaflets on upper surface usually densely fine-pilose; corolla rotate.....*S. toralapanum.*

Midrib of leaflets on upper surface glabrous or subglabrous; corolla mostly rotate-stellate.

S. megistacrolobum.

Usually only the uppermost of the lateral leaflets decurrent on the leaf-rachis or with none decurrent.

Lateral leaflets only broadly sessile, not noticeably decurrent on the leaf-rachis.

Terminal leaflet only slightly larger than the lateral leaflets, typically obovate; peduncle usually well-developed, 3 cm. or more long.....*S. raphanifolium.*

Terminal leaflet usually much larger than the lateral leaflets, typically broadly elliptic; peduncle much-abbreviated, rarely more than 3 cm. long.

S. megistacrolobum.

Some of the uppermost leaflets decurrent on the leaf-rachis.

Uppermost pair of lateral leaflets (of some leaves) conspicuously larger than the next pair below and broadly decurrent on the leaf-rachis.....*S. Hawkesii.*

Uppermost pair of lateral leaflets not conspicuously larger than the next pair below, only slightly decurrent on the leaf-rachis.

Terminal leaflet only slightly larger than the lateral leaflets, typically obovate; peduncle usually well-developed, 3 cm. or more long. . .*S. raphanifolium.*

Terminal leaflet usually much larger than the lateral leaflets, typically broadly elliptic; peduncle much-abbreviated, rarely more than 3 cm. long. *S. megistacrolobum.*

Solanum chavinense Corr., Wrightia 2: 185. 1961. *S. huanucense* Ochoa, Los Solanum Tuberiferos Silvestres del Perú 190, fig. 98. 1963 (dated 1962) (type: Peru, Dept. Huánuco, Prov. Dos de Mayo, hills of Huanca, 3,760 m. alt., 5 km. from Chasqui, May 7, 1961, *C. Ochoa & J. Christiansen 2378*). *Figure 41.*

Among large boulders and trees, and among shrubs on slopes in high mountains, 3,500–4,200 m. alt. North-central Peru.

Plant erect or occasionally bushy, up to 6 dm. tall, usually much shorter, more or less pubescent throughout with coarse hairs, stoloniferous and tuber-bearing; tubers globose to ellipsoid, white, brittle, up to 4 cm. long; stem slender, adorned with long spreading hairs, simple or sometimes branched; leaves odd-pinnate or rarely with some simple, without interstitial leaflets, pubescent on both surfaces with long shaggy hairs, up to 18 cm. long, with the rachis prominently winged; leaflets 3 or 5 or rarely 7 (when not simple); terminal leaflet greatly exceeding in size the adjacent lateral pair, broadly elliptic to suborbicular, obtuse to abruptly acute at apex, cuneate at base, up to 12 cm. long and 6 cm. wide; lateral leaflets elliptic, obtuse to subacute at apex, sessile and basiscopically long-decurrent on the leaf-rachis, up to 6 cm. long and 2.5 cm. wide, the lower pair of leaflets (when present) greatly reduced; pseudostipular leaves semi-elliptic, falcate, up to 2.5 cm. long; inflorescence pseudoterminal, a few- to many-flowered cymose panicle; peduncle short, mostly less than 4 cm. long, branched above; pedicels up to 3 cm. long, slender, coarsely pubescent, prominently articulate well above the middle; flowers usually large and showy, lavender to purplish; calyx 7–10 mm. long, divided to about or below the middle into ovate-lanceolate acute to acuminate lobes, coarsely pubescent, usually with purple pigment; corolla broadly stellate to rotate-stellate, 3–4.5 cm. in diameter; anthers broadly lanceolate in outline, 6–7.5 mm. long; filaments slender, glabrous, 2–3 mm. long; style about 1 cm. long, cellular-papillose below the middle, the stigma usually noticeably capitate; fruit ovoid-ellipsoid to subglobose, somewhat compressed, up to about 2 cm. long.

FIG. 41. *Solanum chavinense* Corr. 1, flowering and fruiting plant (note tuber), × ½; 2, calyx, spread out, × 1; 3, corolla, spread out, × 1; 4, stamen, dorsal view, × 2; 5, pistil, × 2.

The conspicuously basiscopically decurrent lateral leaflets, winged leaf-rachis, long straggly hairs on stem and leaf-rachis, and basic difference in the shape of the corolla set this species apart from the allied and poorly defined *S. dolichocremastrum.*

Solanum chavinense has some resemblance to the Colombian *S. Flahaultii* as well as to *S. medians, S. Weberbaueri,* and *S. tacnaense.* Its differently shaped corolla sets it apart from those species and its non-conical fruit further separates it from the Colombian *S. Flahaultii.*

Ancash: growing among large boulders near pass between Recuay and Chavín, 4,100 m. alt., *Correll & Smith P967* and *P970.* Among brush about boulders, 15 km. above Chavín on road to Recuay, 3,900 m. alt., *Correll & Smith P972.* Among boulders and trees near pass between Recuay and Chavín, 4,200 m. alt., *Correll & Smith P973.* —La Libertad: among shrubs on seepage slope a few km. below Quiruvilca, 3,500 m. alt., *Correll & Smith P942.*

Solanum dolichochremastrum Bitt., Repert. Sp. Nov. 12: 3. 1913. *Figure 42.*

Plant weakly erect, about 4 dm. tall, stoloniferous and doubtless tuber-bearing; tubers unknown; stem slender, terete, essentially glabrous or with very few scattered hairs; leaves odd-pinnate, up to 13 cm. long, with a petiole up to about 3 cm. long, without interstitial leaflets; leaflets 3 or 5 or rarely 7, coarsely pubescent on upper surface, more finely pubescent on lower surface; lateral leaflets sessile at the obliquely cuneate base, elliptic to elliptic-lanceolate, obtuse to acute at apex, up to 4.7 cm. long and 1.6 cm. wide, the lowermost pair greatly reduced; terminal leaflet much larger than the lateral leaflets, rhombic-ovate, obtuse to abruptly short-acuminate at apex, broadly cuneate at base, up to 6.5 cm. long and 4 cm. wide; pseudostipular leaves falcate, much less than 1 cm. long; inflorescence pseudoterminal, few-flowered; peduncle obsolescent; pedicels slender, 2.5–3 cm. long, articulate above the middle, coarsely pubescent and slightly glandular; flower-color unknown; calyx 8–9 mm. long, divided to below the middle into lanceolate long-acuminate lobes, coarsely pubescent; corolla rotate-pentagonal, 2–3 cm. in diameter; anthers oblong-lanceolate in outline, about 5 mm. long; filaments 1–1.5 mm. long, glabrous; style 6 mm. or more long, glabrous, the stigma short; fruit unknown.

The type specimen is so poor that I have hesitated to maintain *S. dolichocremastrum* as a valid species. However, the rhombic-ovate terminal leaflet and sessile or somewhat decurrent lateral leaflets set

FIG. 42. *Solanum dolichocremastrum* Bitt. 1, flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

it apart. On the basis that it will not readily fit into any other known entity it is maintained here along with the hope that eventually ample material will be collected so that its identity can be more clearly understood. It doubtless is related to *S. chavinense*, under which species it is further discussed.

Peru.—Indefinite: *Bombey s.n.*

Solanum hastiformum Corr., Wrightia 2: 187. 1961. *Figure 43.*

Plant erect to erect-ascending, up to about 2.5 dm. tall, rather densely and coarsely pubescent throughout, conspicuously stoloniferous and tuber-bearing, with the stolons giving rise to daughter-plants; tubers minute, ellipsoid, less than 5 mm. long; stem rather stout, simple or branched at base, straight or flexuous; leaves simple or with one or two minute auriculate lobules developed on or just below the cuneate base to make the leaves appear halberd-shaped, up to 8 cm. long (including the petiole) and 3.5 cm. wide, the primary blade ovate to elliptic and subobtuse to acute at apex, the lateral lobules elliptic and up to 1 cm. long; pseudostipular leaves semi-elliptic, broadly falcate, up to about 1 cm. long; inflorescence pseudo-terminal, about 4-flowered; peduncle short, less than 1 cm. long; pedicels 2–5 cm. long, articulate usually about 5 mm. below the calyx, densely pubescent with sharp white hairs; flowers purple-lavender; calyx 6–8 mm. long, divided to below the middle into triangular-lanceolate acuminate lobes, usually somewhat bilabiate; corolla rotate-pentagonal, about 3 cm. in diameter; anthers broadly lanceolate in outline, 5–6 mm. long; filaments broad, glabrous, 1–2 mm. long; style 7–10 mm. long, rather stout, minutely cellular-papillose; fruit (immature) broadly ovoid.

The presence of one or two lateral auriculate lobules on most of the leaves distinguishes this species. The plant is also heavily pubescent with long coarse hairs.

La Libertad: along brushy rocky stream about 3 km. west of Huamachuco, 3,200 m. alt., *Correll & Smith P930.*

Solanum Hawkesii Cárd. ex Cárd. & Hawkes, Jour. Linn. Soc., Bot. 53: 95, Fig. 2. 1946. *Figure 44.*

About boulders and on rocky banks of streams, occasionally in openings of dense forests and as a weed in cultivated areas, 2,000–3,750 m. alt., usually above 3,000 m. Southern Peru.

Plant erect or erect-ascending, up to 6 dm. tall, somewhat stoloniferous and tuber-bearing, more or less coarsely pilose throughout;

FIG. 43. *Solanum hastiformum* Corr. 1, flowering plants, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

tubers small, globose, 2 cm. or more in diameter; stem rather stout; leaves odd-pinnate or rarely with some simple, broadly oblanceolate in outline, up to 25 cm. long, dark green on the upper surface, grayish green on the lower surface, with or without several minute interstitial leaflets; leaflets 3 to 7 or rarely 9; terminal leaflet usually conspicuously larger than the lateral ones, obovate to broadly elliptic or suborbicular, broadly rounded and apiculate to rarely shortly acute at the apex, more or less obliquely cuneate at the base, 5–13 cm. long, 3–9 cm. wide; lateral leaflets similar to the terminal one but much smaller, usually with the uppermost pair conspicuously larger than the pair below and broadly decurrent on the rachis, the lowermost pairs sessile or somewhat decurrent on the rachis; pseudostipular leaves semi-orbicular, falcate, up to 2 cm. long; inflorescence pseudoterminal, 4- to 12-flowered; peduncle 3.5–11 cm. long, bifurcate above, sometimes with one or several scattered minute leaflets; pedicels 1.5–2.5 cm. long, articulate 5–8 mm. below the calyx; flowers dark purple to bluish purple; calyx 6–7 mm. long, divided to about or above the middle into ovate abruptly acute to acuminate lobes; corolla broadly rotate-stellate to occasionally subrotate-pentagonal, 2.5–3 cm. in diameter, the lobes broadly triangular-ovate; anthers 5–6 mm. long, lanceolate in outline; filaments about 1 mm. long, glabrous; style 8–10 mm. long, the stigma swollen; fruit globose, about 2 cm. in diameter.

A distinguishing characteristic of this species is the uppermost pair of lateral leaflets (on some of the leaves) which are much larger than the next pair below, being nearly one-half as large as the terminal leaflet, and which are broadly decurrent on the rachis. It is closely allied to *S. raphanifolium*, and some plants show introgression from *S. megistacrolobum*.

Cuzco: Machu Picchu, about 2,000 m. alt., edge of moist woods, *Cárdenas 3506*. Kcaira, in meadows and about maize fields, 3,150 m. alt., *Carillo & Ross 783*. About 4 km. from Cuzco on road to Pisac, 3,650 m. alt., *Correll & Smith P222*. Calca Prov., in corn fields, Coya, *Correll, Smith & Vargas C. P228*. Near Calca, on stone walls and along roadsides, 3,000 m. alt., *Correll, Smith & Vargas P230 p.p.* Rocky fields and slopes, Piquillacta, Quispicanchis, 3,200 m. alt., *Correll, Smith & Vargas P235*. On open rocky slope, Piquillacta, Quispicanchis, 3,200 m. alt., *Correll, Smith & Vargas P237 p.p.* Above Huancaro on way to Paruro, along rocky bank of mountain stream, 3,300 m. alt., *Correll, Smith & Vargas P240*. Sacsahuamán, among boulders in shade, 3,600 m. alt., *Vargas 2605*. Prov. Canchis, rocky

FIG. 44. *Solanum Hawkesii* Cárd. ex Cárd. & Hawkes. 1, flowering plant, × ½; 2, calyx, spread out, × 2; 3, corolla, spread out, × 1; 4, stamen, dorsal view, × 3; 5, pistil, × 3; 6, fruits, × ½.

places, Huantura, Combapata, *Vargas 5002*. Prov. Cuzco, Cerro Cachana, south of Cuzco, rocky slopes, 3,520 m. alt., *Vargas 7040*. Prov. Acomayo, Acomayo, 3,050 m. alt., *Vargas 7084*. Prov. Urubamba, Pumahuanca, rocky places, 2,900–3,000 m. alt., *Vargas 7652*.

Solanum megistacrolobum Bitt., Repert. Sp. Nov. 10: 536. 1912. *Figure 45*.

In grassy-rocky soil on hills, about rock walls, edge of fields, among bushes, and along streams, usually on the altiplano, 2,700–4,100 m. alt. Southern Peru, through Bolivia to northwest Argentina.

Plant low and bushy to sprawling and much-branched, rarely suberect-ascending, commonly forming a rosette, stoloniferous and tuber-bearing, up to 4 dm. tall, plant mostly light grayish green; tubers globose to ellipsoid, often compressed, up to about 2.5 cm. long and 1 cm. in diameter, yellowish brown, the flesh white; stem essentially lacking to elongate and weak and straggling; leaves simple or odd-pinnate with one to several greatly reduced lateral leaflets, up to 22 cm. long, with scattered short coarse hairs on the upper surface (the midrib on the upper surface glabrous or subglabrous), more finely and densely pubescent on the grayish green lower surface, the rachis and larger veins beneath sometimes provided with a few scattered conspicuously long hairs; petiole more or less winged, up to 4 cm. long; leaflets rarely as many as 7, usually 3 or 5; terminal (or simple) leaflet broadly elliptic or oblanceolate to oval-elliptic or suborbicular, broadly rounded to obtuse-apiculate or very rarely subacute at the apex, broadly rounded to cuneate at the oblique base, 2.5–15 cm. long, up to 7.5 cm. wide; lateral leaflets similar to the terminal one but greatly reduced, sessile or more or less decurrent on the rachis; pseudostipular leaves lacking or minute; inflorescence laxly few (up to 8)-flowered; peduncle rarely up to 5.5 cm. long, usually much shorter, sparsely pilose; pedicels 1.5–5 (rarely 7) cm. long, articulate 4–10 mm. below the calyx, sparsely pilose and often glandular (especially above the articulation); flowers purplish or violet-color, rather showy; calyx 4–10 mm. long, irregularly divided to below the middle into ovate to ovate-lanceolate or narrowly lanceolate acute to acuminate lobes, sometimes bilabiate (caused by partial fusion of two lobes), rather densely pubescent with coarse whitish hairs; corolla broadly rotate-stellate to subrotate, 2.5–3.5 cm. in diameter, the acumens broadly triangular-ovate, often densely pubescent on outer surface; anthers about 5 mm. long, elliptic-lanceolate in outline, frequently irregular and sometimes slightly lobulate at base; filaments about

FIG. 45. *Solanum megistacrolobum* Bitt. 1, plant, × ½; 2, calyx, spread out, × 2; 3, corolla, spread out, × 1; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

1.5 mm. long, broadly triangular, glabrous, connivent below; style 7–10 mm. long, usually thick, exceeding the stamens, tapering to the capitate and somewhat bilobed stigma; fruit globose to broadly ovoid, sometimes compressed, up to about 2.5 cm. in diameter.

Although the more than 40 plants which comprise the type collection of *S. megistacrolobum* reveal a high degree of variation, they all have the broadly rotate-stellate corolla and leaves or leaflets blunted or only apiculate or rarely subacute at the apex. The plants vary from a rosette to those that have elongated straggly stems, and the peduncles and pedicels are also variable in length. The leaves are simple with the blade elliptic to oblanceolate or much-dissected with one or more strongly decurrent lateral leaflets or as many as six merely sessile lateral leaflets. Interstitial leaflets may or may not be present.

Cuzco: between Araranca and Aguas Calientes, *Cook & Gilbert 185*. Fort Pucara, 7 km. from Cuzco on road to Pisac, 3,750 m. alt., *Correll & Smith P220*. About 4 km. from Cuzco on road to Pisac, *Correll & Smith P222*. On open rocky slope, Piquillacta, Quispicanchis, 3,200 m. alt., *Correll, Smith & Vargas C. P237 p.p.* Prov. Canchis, near Sicuani, 3,550 m. alt., *Vargas 5920*.—Puno: rocky hills just above Puno, 3,700 m. alt., *Correll & Smith P193–P194*. Prov. Puno, among rocks, 5 km. from Puno on way to Juliaca, 4,000 m. alt., *Perez, Rimpau, Ross & Vargas C. 687*. Prov. Puno, Escola Salcedo, on rocky slope with *Colletia* and *Buddleya*, 3,900 m. alt., *Perez, Ross & Vargas 661–662*.

Solanum raphanifolium Cárd. & Hawkes, Jour. Linn. Soc., Bot. 53: 94, Fig. 1. 1946. *Figures 46, 47*.

On rocky, open, grassy slopes, in loose volcanic soils and on gravelly mounds, and about cultivated fields, 2,800–3,800 m. alt. Southern Peru.

Plant semirosette to shortly much-branched and decumbent-spreading or rarely erect-ascending, up to 3 dm. tall, more or less pilose throughout, stoloniferous and tuber-bearing; tubers globose, whitish to purplish, up to 4.5 cm. in diameter, the flesh often suffused with purple; leaves odd-pinnate, 5–15 cm. long, coarse-textured and heavily veined, dark green and with scattered coarse hairs on the upper surface, grayish green and more densely and finely pubescent on the lower surface, with or without interstitial leaflets; leaflets 5 to 9; lateral leaflets ovate to obovate, sessile or somewhat decurrent on the rachis, broadly rounded to subacute or apiculate at the apex,

the larger ones up to 4 cm. long and 2.5 cm. wide, the uppermost pair usually not conspicuously larger than the pair below; terminal leaflet mostly only slightly larger than the adjacent lateral pair, broadly elliptic to obovate, broadly rounded and apiculate at the apex, cuneate at the somewhat oblique base, up to 6 cm. long and 5.5 cm. wide; pseudostipular leaves obliquely elliptic, falcate, less than 1 cm. long; inflorescence pseudoterminal, 3- to 10-flowered, subumbellate to cymosely paniculate; peduncle 3–9 cm. long; pedicels 1.5–3 cm. long, articulate 4–9 mm. below the calyx, sparsely pilose and occasionally somewhat glandular, often tinged with purple; flowers deep violet-color or dark purple; calyx 6–8 mm. long, divided to about the middle into ovate to ovate-lanceolate acute to acuminate lobes, usually purplish, the margins of the lobes often scarious; corolla broadly rotate-stellate, 2.5–3 cm. in diameter, the lobes broadly triangular-ovate; anthers 5–6 mm. long, lanceolate in outline; filaments 1–2 mm. long, glabrous; style 7.5–9 mm. long, papillose below, the stigma globose; fruit ovoid to globose, green, marked with dark green or purple, about 2 cm. long.

This species and *S. Hawkesii* are closely allied.

Cuzco: Sacsahuamán, near Cuzco, *Cárdenas & Gándarillas 3500.* Sacsahuamán, *Cárdenas & Gándarillas 3501.* Temple of Viracocha, near Tinta, in loose volcanic rock, about 3,500 m. alt., *Cook & Gilbert 199.* Fort Sacsahuamán, above Cuzco, rocky slopes and fields, *Correll & Smith P218.* On gravelly mound near Fort Pucara, 7 km. from Cuzco on road to Pisac, 3,750 m. alt., *Correll & Smith P219.* Fort Pucara, 7 km. from Cuzco on road to Pisac, 3,750 m. alt., *Correll & Smith P221.* Korau, 15 km. from Cuzco on road to Pisac, rocky open slope, 3,500 m. alt., *Correll, Smith & Vargas C. P224.* Rocky hills between San Geronimo and Sailla, *Correll & Smith P233.* Rocky fields, Piquillacta, Quispicanchis, 3,200 m. alt., *Correll, Smith & Vargas P234.* Recolecte, Cuzco, on edge of fields, *Correll, Smith & Vargas P241.* Kcaira, among maize, 3,200 m. alt., *Carillo & Ross 780.* Kcaira, in meadows and on edge of maize fields, 3,150 m. alt., *Carillo & Ross 782 p.p.* On hills of Sacsahuamán, 3,500 m. alt., *Herrera 2343.* Prov. Calca, Pisac, abundant in damp meadows on way from Intihuatana, 3,200 m. alt., *Rimpau, Ross & Vargas C. 802.* Prov. Anta, Pampa de Anta, 3,400 m. alt., *Vargas 4856.* Prov. Urubamba, between Urubamba and Tanahuana, 2,800 m. alt., *Vargas 7070.* Prov. Canchis, slopes of Sicuani, among herbs and mosses, 3,700–3,800 m. alt., *Vargas 9839 p.p.*

FIG. 46. *Solanum raphanifolium* Cárd. & Hawkes. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 2; 3, corolla, spread out, × 1; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

FIG. 47. *Solanum raphanifolium* Cárd. & Hawkes. Flowering plant, × ½.

Solanum sogarandinum Ochoa, Agronomía (Lima) 19: 168, Figs. 3–5. 1954. *S. sogarandae* ex Firbas and Ross, Zeit. Pflanzenzücht. 45:261. 1961. *Figure 48.*

Plant low and bushy, stoloniferous and tuber-bearing, up to about 20 cm. tall, more or less pubescent throughout with long hairs; tubers white, globose, 2–3 cm. in diameter, with numerous lenticels; stem stout, abbreviated, up to about 10 cm. long; leaves odd-pinnate, rosulate to subrosulate, oblanceolate in outline, up to 20 cm. long and 7 cm. wide, essentially without interstitial leaflets; leaflets 5 to 9; terminal leaflet elliptic to ovate-elliptic, subacute to obtuse at apex, cuneate at base, up to 9.5 cm. long and 5 cm. wide, greatly exceeding in size the adjacent pair of lateral leaflets; lateral leaflets ovate to ovate-elliptic, obtuse at apex, the upper pairs noticeably basiscopically decurrent on the leaf-rachis, up to 5.5 cm. long and 2.7 cm. wide; pseudostipular leaves minute (if present); inflorescence 7- to 9-flowered, pseudoterminal; peduncle abbreviated, up to 1.5 cm. long, light green; pedicels 2.5–3.5 cm. long, articulate within 6 mm. of calyx; flowers blue or purplish lavender, the center with yellowish green star; calyx 6–7 mm. long, greenish and pigmented, pubescent, divided to below the middle into ovate-lanceolate acuminate lobes; corolla rotate, about 3 cm. in diameter; anthers broadly triangular-lanceolate in outline, about 5 mm. long and 2.5 mm. wide at base; filaments stout, glabrous, slightly united above their attachment to the corolla, about 1 mm. long; style short and stout, glabrous, about 8 mm. long, the stigma conical; fruit subglobose.

Except for its consistently more dissected leaves, this plant is essentially identical in habit to *S. megistacrolobum.* The pubescence and long pedicels that are articulate just below the calyx are characteristics of *S. megistacrolobum.* It differs from that species, however, in its apparent geographic isolation, less constricted calyx-lobes and in its rotate corolla. Some plants from southern Peru and Bolivia, however, which I consider to be referable to *S. megistacrolobum* occasionally may have subrotate corollas.

La Libertad: Sogaranda, near Santiago de Chuco, *Ochoa 1440.*

Solanum toralapanum Cárd. & Hawkes, Jour. Linn. Soc., Bot. 53: 98, Fig. 4. 1946. *Figures 49, 50.*

On rocky-grassy slopes, among boulders and shrubs, and occasionally about cultivated fields, 3,000–4,500 m. alt. Southern Peru, Bolivia and northwest Argentina.

FIG. 48. *Solanum sogarandinum* Ochoa. 1, flowering plant, × ½; 2, calyx spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3; 6, fruits, about × 1.

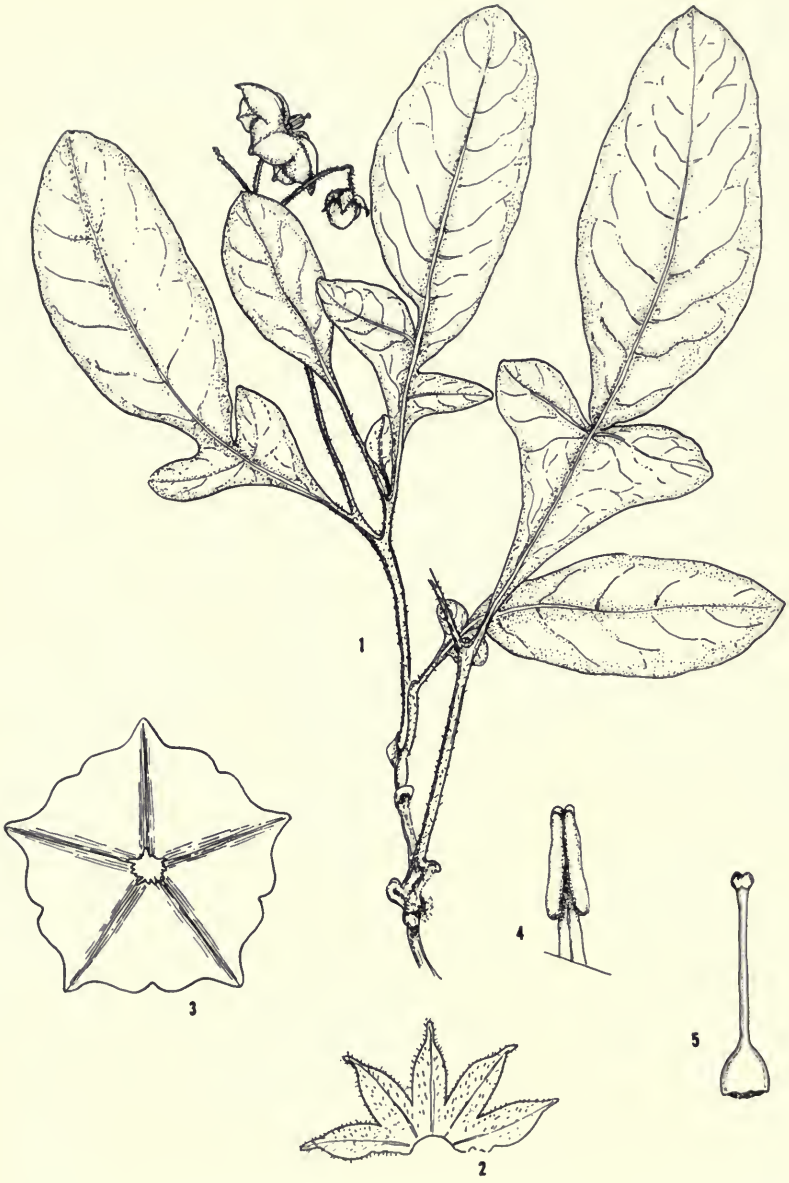

FIG. 49. *Solanum toralapanum* Cárd. & Hawkes. 1, flowering plant, × ½; 2, calyx, spread out, × 3; 3, corolla, spread out, × 1; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

FIG. 50. *Solanum toralapanum* Cárd. & Hawkes. 1, leaf, × ½; 2, leaf, × ½. *Solanum toralapanum* var. *subintegrifolium* Cárd. & Hawkes. 3, flowering plant × ½; 4, flowering plant, × ½.

Plant rosulate or with short ascending branches, spreading, up to 3 dm. tall, stoloniferous and tuber-bearing, rather coarsely and densely pilose throughout; stem essentially lacking to well-developed; leaves rather coarse and thick, irregularly odd-pinnate or odd-pinnatifid, rarely with some simple, up to about 2.5 dm. long, usually much shorter, rarely with one or several interstitial leaflets; midrib on the upper surface usually densely fine-pilose, the rachis and larger veins on lower surface often provided with scattered conspicuously long hairs; leaflets rarely as many as 9; terminal leaflet elliptic to narrowly oblanceolate or suborbicular-ovate, broadly rounded or occasionally apiculate at the apex, tapering into the rachis below, up to 12 cm. long and 5.5 cm. wide; lateral leaflets much smaller than the terminal one, obliquely triangular-ovate, obtuse, broadly sessile and usually manifestly decurrent on the rachis, up to 4 cm. long; inflorescence one- to several-flowered; peduncle up to 8 cm. long, usually densely pilose; pedicels 1–3 cm. long, articulate 4–6 mm. below the calyx, densely pilose; flowers dark violet-color; calyx 5–9 mm. long, densely pilose with long hairs, divided to about the middle into ovate to ovate-lanceolate acute to acuminate lobes; corolla rotate-pentagonal to somewhat rotate-stellate, 2–3 cm. in diameter, the acumens rather prominent, often conspicuously pilose on the outer surface; anthers oblong-lanceolate in outline, 4.5–5.5 mm. long; filaments 1–1.5 mm. long, glabrous; style 6–8 mm. long, stout, tapering to the globose stigma; fruit globose to somewhat ovoid, about 1 cm. in diameter.

This species and *S. megistacrolobum* are closely allied. The plants, however, are not only more densely pubescent throughout than in that species but the lateral leaflets, when present, are more strongly and broadly decurrent on the rachis. The peduncle, too, is usually more well-developed, and the corolla is typically more rotate. Although these two segregates appear to merge one into the other, it seems advisable to recognize this as such and to maintain the extreme conditions as separate entities.

Puno: among rocks on mountain slope, Camacani, 27 km. southeast of Puno, 4,100 m. alt., *Correll & Smith P213*. Near Puno, 4,000 m. alt., *Soukup 263*.

Solanum toralapanum var. **subintegrifolium** Cárd. & Hawkes, Jour. Linn. Soc., Bot. 53: 99, Fig. 5. 1946. *Figure 50.*

Variety *subintegrifolium* is similar to typical *S. toralapanum* except, as its name implies, for the entire or essentially entire leaves. These are usually shortly petioled or nearly sessile. The plants are

typically rosulate, but sometimes stems may develop up to 2 dm. in length.

Puno: Prov. Lampa, Munañi, among rocks, 4,150 m. alt., *Vargas C. 8271 p.p.*

Series 12. ACAULIA

Acaulia Juz., Bull. Acad. Sci. U.R.S.S., ser. Biol. 2: 316. 1937, *nom. nud.*; ex Buk. & Kameraz, Bases of Potato Breeding 21. 1959.

Acaulescent (or essentially so) rosette-forming herbs, often prostrate, stoloniferous and tuber-bearing; leaves odd-pinnate; lateral leaflets obtuse, typically auricled at the base on the acroscopic side; peduncle absent or much-abbreviated; pedicel-articulation absent or evidenced only by a ring of pigment or very rarely fairly well-marked a little below the calyx; corolla rotate, purple to white; fruit subglobose to ovoid.

Flowers white; plant conspicuously long-pubescent with spreading white hairs ..... *S. acaule* var. *albicans.*

Flowers violet-blue to purplish; pubescence not as above ... *S. acaule.*

Solanum acaule Bitt., Repert. Sp. Nov. 11: 391. 1921; 12: 453. 1913. *S. acaule* var. *subexinterruptum* Bitt., Repert. Sp. Nov. 11: 393. 1912. *S. acaule* var. *caulescens* Bitt., Repert. Sp. Nov. 12: 453. 1913. *S. punae* Juz., Bull. Acad. Sci. U.R.S.S., ser. Biol. 2: 316. 1937 (type: Peru, Cerro de Pasco, in puna, *Juzepczuk 10414, 10435*, grown near Leningrad, Russia). *S. acaule* var. *checcae* Hawkes, Bull. Imp. Bur. Pl. Breed. & Genet., Cambridge 2: 22, 115, Fig. 5. 1944. *S.acaule* var. *punae* (Juz.) Hawkes, Bull. Imp. Bur. Pl. Breed. & Genet., Cambridge 2: 23. 1944. *S. depexum* var. *chorruense* Hawkes, Bull. Imp. Bur. Pl. Breed. & Genet., Cambridge 2: 23, 115. 1944. *Figures 51, 52.*

In rocky or grassy areas or on disturbed or denuded soils in alpine meadows and on the puna, sometimes on sandbars and about ledges along streams or in cultivated areas, 3,500–4,600 m. alt., usually at about or above 4,000 m., rarely below 3,500 m. Northern Peru, southward through Bolivia to northwest Argentina. According to Bukasov (1939), this species withstands temperatures as low as —8° C (15° F), and grows up to near 5,000 meters altitude, the line of eternal snow.

Plant small, low and bushy or forming rosettes that are sometimes up to 4 dm. in diameter, usually much smaller, commonly

spread flat on the ground, coarsely pubescent throughout to rarely subglabrous, stoloniferous, with the stolons bearing tubers or giving rise to daughter-plants; tubers irregularly globose to ellipsoid, mostly pale brown, up to about 2.5 cm. long; stem essentially lacking to greatly abbreviated, rarely more than 5 cm. long above ground, sometimes extending deeply below the surface of the ground; leaves odd-pinnate, usually manifestly rosulate, spreading on the ground or widely ascending, mostly oblanceolate in outline, 6–19 cm. long, with or without small interstitial leaflets; rachis rather broad; leaflets 7 to 15, sessile and more or less auriculate at the base (especially on the acroscopic side), broadly ovate-elliptic to suborbicular, rounded to obtuse at the apex, broadly rounded to somewhat cordate (because of the auricles) at the oblique base, up to 6 cm. long and 4.5 cm. wide, usually much smaller; terminal leaflet usually somewhat larger than the lateral ones; pseudostipular leaves minute, inconspicuous or sometimes apparently lacking; inflorescence usually 3- to 6-flowered and rising directly from crown of plant or several flowers together on a poorly developed peduncle on the abbreviated stem; peduncle wanting or greatly abbreviated, usually less than 1 cm. long; pedicels stout, 1–2 (rarely to 3.5) cm. long, articulate within 5 mm. of the calyx, the articulation evident (in var. *aemulans*) or lacking, sometimes marked by a ring of pigment, commonly recurved (especially above the middle); flowers dark purple to violet-blue or rarely whitish; calyx 3–6 mm. long, divided to about or above the middle into triangular-ovate to lanceolate subobtuse to acute or subacuminate lobes, sometimes bilabiate; corolla rotate, 1–2 cm. in diameter, the acumens minute; anthers ellipsoid or oblong in outline, 2–4 mm. long; filaments 1–1.5 (rarely to 3) mm. long, glabrous; style 5–7 mm. long, thick, cellular-papillose below the middle, the stigma globose; fruit subglobose to ovoid, green and often tinged or mottled with dark green or purple, up to 2 cm. long.

This species, in nature, is typically an essentially acaulescent plant that bears a rosette of wide-spreading leaves. Under cultivation and out of its native environs, however, it becomes robust and often develops a rather prominent leafy stem. Some such plants that were produced under cultivation at Grenoble, France, were given the name var. *caulescens* by Bitter. Caulescent plants are also found in nature, usually in sheltered situations or at lower elevations in the area of distribution of the species.

Plants included here vary considerably, especially in the absence or presence of interstitial leaflets, the amount of pubescence present,

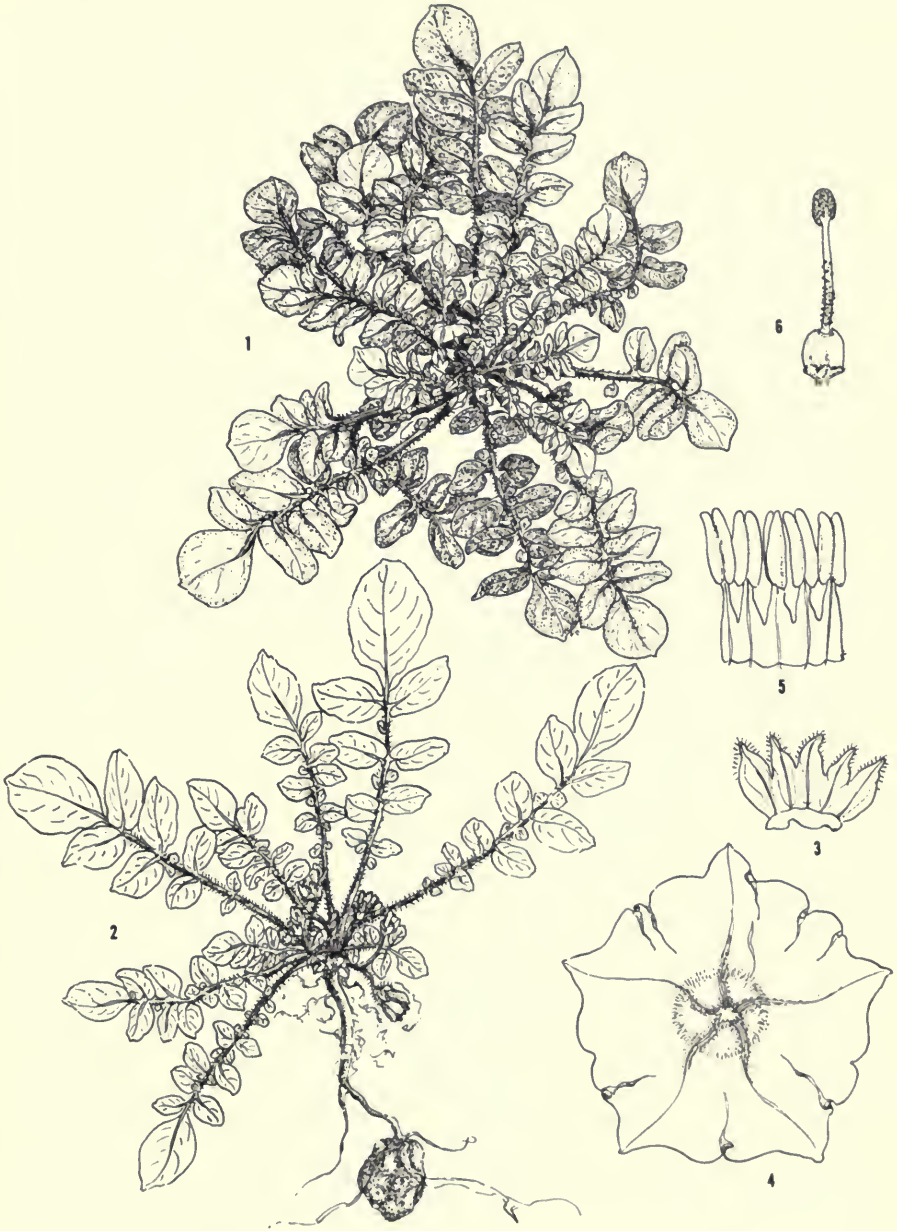

FIG. 51. *Solanum acaule* Bitt. 1 and 2, flowering plants, × ½; 3, calyx, spread out, × 2; 4, corolla, spread out, × 2; 5, stamens, dorsal view (note united filaments), × 3; 6, pistil, × 3.

and in the color of the flowers. In spite of these variations this species is rather readily recognized by its usually rosette-type of habit with greatly abbreviated stem and peduncle, and the acroscopically auriculate lateral leaflets.

It is of interest that the articulation of the pedicel in this species is usually not apparent. When it is evident, however, it occurs usually as a ring of pigment a short distance below the calyx. Because of this inarticulation of the pedicels, the flowers and fruits remain on the plant instead of dropping off.

In Arequipa Department, Peru, and other areas of the xerophytic western side of the Andes, this species is found in alpine meadows and along water course. It is often especially common on and about the "chosas," the places where llamas congregate at night. The urine and droppings make these spots fertile oases in an otherwise extremely dry and sterile soil.

Ancash: about rock walls on mountain slope, Recuay, 3,750 m. alt., *Correll & Smith P966*. Prov. Bolognesi, Laguna de Huamanhueque, near Auia, puna, 4,400 m. alt., *Ferreyra 12157*.—Arequipa: Canaguas, alpine meadow, 4,078 m. alt., *Correll & Smith P178*.—Ayacucho: 90 km. from Nazca on road to Puquio, on sandbar along stream, 3,900 m. alt., *Correll & Smith P154*. On cumbre, altiplano, about 117 km. from Nazca on road to Puquio, 4,500 m. alt. (temperature near or about freezing at night), *Correll & Smith P155*. Prov. Huanta, Mt. Razubuillca, 4,050 m. alt., *Weberbauer 7501*.—Cajamarca: open grassy slope, 6 km. from entrance in Hacienda Porcón, north of Cajamarca, 3,500 m. alt., *Correll & Smith P863*.—Cuzco: Araranca, south side of La Raya Pass, about 4,100 m. alt., *Cook & Gilbert 180, 181, 182a*. Prov. Canas, Checca, *Vargas C. 2005*. Prov. Canchis, Aguas Calientes, 4,150 m. alt., *Vargas 3315*. Callachaca, small open slope, 3,400 m. alt., *Vargas 5506*. Prov. Espina, Puente "St. Domingo," rocky slope, 3,890–4,100 m. alt., *Vargas 5647*. Prov. Canas, "El Descanso" en "pajonal," 4,250 m. alt., *Vargas 10037*. Sicuani, before 1914, *no collector given*.—Huancavelica: between Laria and Tambopata, 3,900–4,000 m. alt., *Tovar 836*.—Junín: 20 km. south of La Oroya, in pampa, *Blood & Tremelling 34*. In high grassland, Phachaccaca, 4,000 m. alt., *Correll & Smith P725*. High grassland, Km. 34 on road between Jauja and Tarma, 4,100 m. alt., *Correll & Smith P751*.—Lima: on open mountain slope above Cullluay, 4,050 m. alt., *Correll, Smith & Ferreyra P298*. Río Blanco, disintegrated granite slope, 4,570 m. alt., *Macbride 3017*. Prov. Yauyos, between Pallca and Huacracocha, puna, 4,200–4,300 m. alt., *Tovar*

FIG. 52. *Solanum acaule* Bitt. 1, flowering and fruiting plant, to show robust form, × ½. *Solanum acaule* var. *aemulans* (Bitt. & Wittm.) Corr. 2, flowering plant, × ½ (endemic to Argentina).

255.—Puno: alpine meadow, Lagunillos, 4,300 m. alt., *Correll & Smith P179.* Along river meadow edge, Maravillas, 3,900 m. alt., *Correll & Smith P180.* Among boulders in disturbed soil, 6 km. from Puno on road to Arequipa, 4,000 m. alt., *Correll & Smith P181.* In shelter of rock wall, 4 km. from Puno on road to Arequipa, 3,900 m. alt., *Correll & Smith P191, P192.* Near Camacani, 27 km. southeast of Puno, crevices of cliffs, 4,100 m. alt., *Correll & Smith P124.* Cabrasillo, near Puno, 3,820 m. alt., *Ochoa 2031.* Chuquibambilla, rocky place in puna, 3,850–3,900 m. alt., *Pennell 13389.* Minas de San Antonio, Puno, 4,200 m. alt., *Sandeman 3933.* Santa Lucia, the pampa, 4,260 m. alt., *Sharpe 120.* Juliaca, meadows, 3,800 m. alt., *Stafford 431.* Prov. Carabaya, Macusani, Hacienda Lacka, among rocks, 4,450 m. alt., *Vargas 7023.* Prov. Lampa, Munañi, among rocks, 4,150 m. alt., *Vargas 8271 p.p.*—Tacna: Tarata, 2,100 m. alt., *Vargas 9262.*—Indefinite: 1839–1840, *Gay s.n.* In dry cultivated places, 4,000 m. alt., *Weddell 4376.*

Solanum acaule var. **albicans** Ochoa, Agronomía (Lima) 17 (4): 363, Fig. 1960.

Variety *albicans* differs from typical *S. acaule* and the several other variants proposed for this species in its robustness, doubtlessly the result of its increased chromosome complement (2n=72), and in its dense investment of long, white, spreading hairs. The flowers are also white, though it is not distinctive in this characteristic.

Cajamarca: Jalcas de Atocsaicu, near Porcón, 3450 m. alt., *Ochoa 2065.*

Series 13. TRANSAEQUATORIALIA

Transaequatorialia Buk. ex. Buk. & Kameraz, Bases of Potato Breeding 21. 1959.

Andreana Hawkes, Bull. Imp. Bur. Pl. Breed. & Genetics, Cambridge 2: 50. 1944. Without Latin diagnosis.

Plants herbaceous to slightly woody, glabrous to densely pubescent, very rarely somewhat glandular, stoloniferous and tuber-bearing, the tubers usually small; stems winged or unwinged; leaves simple or odd-pinnate, with or without interstitial leaflets; leaf-rachis sometimes slightly winged; leaflets sessile to long-petiolulate, rarely with the uppermost pair of lateral leaflets somewhat decurrent on the leaf-rachis; pedicels variously articulate above the base; corolla rotate to stellate; fruits globose to ovoid, rarely broadly and shortly ellipsoid or somewhat conic.

With the exception of *S. chancayense*, of coastal Peru, the species are confined to the mountains from western Venezuela southward to northwest Argentina.

Leaves without or with only several (1–4) interstitial leaflets.

Plant less than 1.5 dm. tall; stem greatly abbreviated; leaves subrosulate..... *S. pumilum.*

Plant bushy-spreading or erect, usually much more than 2 dm. tall; stem well-developed.

Distribution in the loma vegetation zone along the coast, below 400 m. alt..... *S. chancayense.*

Distribution in mountains above 1,500 m. alt.

Corolla distinctly rotate.

Plant more or less glandular throughout..... *S. orophilum.*

Plant often pubescent but not noticeably glandular.

Corolla 3 cm. or less in diameter; calyx mostly 6 mm. or less long; pedicels usually 2 cm. or less long.

Pedicels articulate at or well below the middle; leaflets up to 6 cm. long and 3.5 cm. wide... *S. catarthrum.*

Pedicels noticeably articulate above the middle; leaflets usually much larger than the above. *S. sparsipilum.*

Corolla 3 cm. or more in diameter; calyx mostly more than 6 mm. long; pedicels usually 2 cm. or more long.

Leaves usually about 1 dm. long; calyx 6 mm. or less long; corolla ample and typically much pleated when flattened..... *S. pascoense.*

Leaves larger than above; calyx 6 mm. or more long; corolla not as above.

Filaments somewhat united above their attachment to the corolla; calyx 6–8 mm. long. *S. espinarense.*

Filaments free; calyx 8–10 mm. long.

Leaves usually 10 cm. or less long; leaflets usually about 1.5 cm. wide. *S. rhomboideilanceolatum* var. *ancophilum.*

Leaves and leaflets usually larger than above. *S. rhomboideilanceolatum.*

Corolla stellate or rotate-stellate.

Leaflets of uppermost pair up to 13 cm. long and 10 cm. wide, abruptly acute to short-acuminate; acumens of corolla conspicuous.

Plant densely pilose with silky yellowish hairs; inflorescence rather compact.....*S. villuspetalum.*

Plant subglabrous to sparsely pubescent; inflorescence open and wide-spreading.....*S. multiflorum.*

Leaflets of uppermost pair smaller than above, obtuse to acute or rarely acuminate at apex.

Plant rather densely glandular throughout.

Corolla up to 2.5 cm. in diameter; plant strictly erect. *S. lignicaule.*

Corolla 2.5 cm. or more in diameter; plant erect-ascending.....*S. orophilum.*

Plant more or less pubescent but not glandular.

Leaves without interstitial leaflets; distribution northern Peru.....*S. jaenense.*

At least some leaves with several minute interstitial leaflets; distribution southern Peru.

Pedicels articulate at or well below the middle; leaflets up to 6 cm. long and 3.5 cm. wide. *S. catarthrum.*

Pedicels noticeably articulate about the middle; leaflets usually much larger than the above. *S. sparsipilum.*

Leaves usually with numerous interstitial leaflets, at least more than 4.

Leaflets 13 or more per leaf, narrowly lanceolate, less than 1 cm. wide.....*S. gracilifrons.*

Leaflets fewer and broader than those above.

Plant low and bushy, the leaves sometimes subrosulate; stem usually much-abbreviated.

Corolla 2.8 cm. or more in diameter.....*S. Bukasovii.*

Corolla rarely up to 3 cm. in diameter.

Plant (especially stem and leaf-rachises) densely pubescent with long shaggy hairs..*S. Lobbianum* f. *multidissectum.*

Plant only sparsely pubescent.....*S. aracc-papa.*

Plant usually erect or ascending, the leaves not rosulate; stem usually well-developed.

Leaflets typically large, broadly elliptic to obovate-elliptic, sometimes up to 14 cm. long and 6 cm. wide.

Corolla rotate-stellate to rotate-substellate; calyx very irregularly lobed. . . *S. sparsipilum* var. *llallaguanianum.*

Corolla rotate-pentagonal; calyx usually regularly lobed.

Leaflets broadly rounded to cuneate at base; distribution northern and central Peru.

Plant sparsely pubescent.

Leaflets rather long-petiolulate.

S. multiinterruptum var. *machaytambinum.*

Leaflets usually sessile to somewhat decurrent on the leaf-rachis. . . . . *S. multiinterruptum.*

Plant with long whitish lax hairs as well as scattered capitate glands.

S. multiinterruptum f. *longipilosum.*

Leaflets with some usually truncate or cordate at base; distribution southern and central Peru.

Inflorescence compact; corolla 3.5 cm. or more in diameter; pubescence coarse. . . . . *S. amabile.*

Inflorescence rather lax and spreading; corolla 3.5 cm. or less in diameter; pubescence fine. . *S. ambosinum.*

Leaflets typically small, suborbicular to ovate-elliptic or elliptic, rarely up to 7 cm. long and 3.5 cm. wide.

Leaflets more or less cordate at base, mostly long-petiolulate.

S. Abbottianum.

Leaflets rounded to cuneate at base, sessile to shortly petiolulate.

Petal-lobes broad and truncate at apex; calyx-lobes sometimes bilabiate; stem often with multiple pustulate hairs. . . . . *S. Soukupii.*

Petal-lobes not truncate; calyx-lobes rather regular; stem without multiple pustulate hairs.

Plant coarsely pilose; corolla usually about 2.5 cm. in diameter. . . . . *S. leptophyes.*

Plant finely silky-pubescent (especially on lower surface of leaflets); corolla usually much more than 2.5 cm. in diameter.

Leaflets coriaceous, their upper surface vernicose and sparsely pilose.....*S. canasense* var. *xerophyllum.*

Leaflets not as above.

Plant exceptionally branched and floriferous; leaves usually profusely dissected; leaflets long-petiolulate, their margins commonly undulate and pleated.

S. canasense var. *neohawkesii.*

Plant and leaves not as above.

Leaflets about 6 cm. long and 3 cm. wide; interstitial leaflets few.

S. canasense var. *calcense.*

Leaflets smaller than those above; interstitial leaflets usually numerous....*S. canasense.*

Solanum Abbottianum Juz., Bull. Acad. Sci. U.R.S.S., ser. Biol. 2: 305. 1937. *Figure 53.*

On hills and mountain slopes, along streams usually among rocks and trees or shrubs, 2,900–3,900 m. alt. Central and southern Peru.

Plant bushy or weakly ascending, more or less coarsely pubescent throughout or rarely subglabrous, up to about 5 dm. tall, usually much shorter, stoloniferous and tuber-bearing; tubers unknown; stem slender, branched to subsimple, narrowly winged, mostly with some long white spreading hairs; leaves rosulate or caulescent, 5–20 cm. long, with or rarely without interstitial leaflets, densely or sparsely pilose; leaflets 9 to 13, rarely 7, usually prominently petiolulate; lateral leaflets broadly ovate to broadly elliptic or occasionally obovate, obtusish to acute at apex, broadly rounded to truncate or cordate at the somewhat oblique base, 1.5–5.5 cm. long, 1–2.5 cm. wide; terminal leaflet usually slightly larger than the lateral ones; pseudostipular leaves semi-elliptic, falcate, about 1 cm. long; inflorescence pseudoterminal, 3- to 15-flowered; peduncle slender, up to 16 cm. long, usually shorter, branched above, pale green and often purple-maculate, subglabrous to densely pubescent or glandular-pubescent; pedicels slender, 1.5–3 cm. long, articulate well above the middle and commonly within 6 mm. of the calyx, sometimes articulate below the middle; flowers pale violet-blue to purplish blue, commonly with a central green star; calyx 6–10 mm. long, divided to about or below the middle into ovate to ovate-lanceolate acuminate or sometimes mucronate lobes, sparsely or densely pubescent; corolla rotate-pen-

FIG. 53. *Solanum Abbottianum* Juz. 1, flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3; 6, leaf, × ½.

tagonal, 2.5–4 cm. in diameter, spreading, the lobes prominent; anthers lanceolate in outline, about 6 mm. long; filaments often thick, glabrous, 2–3 mm. long; style 10–12 mm. long, glabrous, the stigma usually prominently thickened; fruit ovoid, 1.5–2 cm. long.

Solanum Abbottianum is a link in what appears to be a complicated taxonomic chain involving a half dozen or more entities that are here recognized as species. Some of the others in this involvement are *S. canasense* and its varieties, *S. Lobbianum* and its *f. multidissectum*, *S. brevicaule*, *S. leptophyes*, and *S. Bukasovii*.

This species apparently forms the closest alliance with *S. Bukasovii* and it quite probably should be considered as only a form of that species. It is, however, here maintained separately from *S. Bukasovii*, based primarily on its typically strongly petiolulate broad leaflets that are often truncated or somewhat cordate at the base. Although in describing this species Juzepczuk stated that it differed from *S. Bukasovii* by its more numerous leaflets, somewhat lower pedicel-articulations, narrower and not quadrate anthers, and shortly acuminate calyx-lobes, these stated differences do not appear to hold fast.

Ayacucho: 20 km. from Ayacucho on way to Chiara, growing with *Cassia, Calceolaria, Bidens, Baccharis, Lupinus*, etc., 2,900 m. alt., *Perez, Rimpau, Ross & Vargas C. 978*.—Cuzco: Prov. Espinar, on rocks, bridge of "Sto. Domingo," 3,895 m. alt., *Vargas 5648*.—Huancavelica: 20 km. beyond La Mejorada, on way to Huancayo, among *Kageneckia lanceolata, Tecoma stans, Dodonacea*, etc., 3,000 m. alt., *Perez, Rimpau, Ross & Vargas 983*. Larmes, hills near Conaica, among trees, 3,400 m. alt., *Tovar 171*.—Junín: near Jauja, *Abbott s.n.* In grasses along stream on road to Central Cattle Farm, Huancayo, 3,550 m. alt., *Correll & Smith P731*. Prov. Jauja, Hacienda Runatullo, district of Comas, *Ochoa 60*. Near Concepción, Quichuay, 3,300 m. alt., *Ochoa 75*. "Carnencerro Km. 22–24," on road from Concepción to Satipo, 3,700 m. alt., *Ochoa 83*. On hills by way of Hualhuas, near Huancayo, 3,280 m. alt., *Ochoa 683*. Prov. Huancayo, near Huancayo, beyond Huayucachí, 3,100 m. alt., *Ochoa 719 p.p.* Prov. Huancayo, near Hacienda Acopalca, 3,600 m. alt., *Ochoa 998*. Edge of Road, Huancayo-Acopalca, *Ochoa 999*. Huaychulo near Huancayo, along stream, 3,300 m. alt., *Ochoa & Ross 1020 p.p.* 10 km. from Acostambo to Huancayo, 3,400 m. alt., *Perez, Rimpau, Ross & Vargas 989*. Huancayo, *Soukup 3986*. Prov. Huancayo, Acopalca, *Soukup 3689*.—Lima: in brush among boulders at Km. 120 below Casapalca, 3,750 m. alt., *Correll & Smith P724*. Prov. Huaro-

FIG. 54. *Solanum amabile* Vargas. 1, upper part of flowering plant and basal leaf in background, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

chirí, Chicla, between San Mateo and Casapalca, road from Lima to Huancayo, rocky slopes, 3,700 m. alt., *Ferreyra 6521*. Prov. Huarochirí, Río Blanco, between San Mateo and Casapalca, among rocks on mountain slope, 3,500–3,550 m. alt., *Ferreyra 6985*. Prov. Huarochirí, Río Blanco, grassy area along road between Lima and Oroya, 3,300–3,400 m. alt., *Ferreyra 8940*.

Solanum amabile Vargas, Diez Años Servic. Bot. Univ. Cuzco 46. 1946, *nom. nud.*; Las Papas Sudperuanas, Part II (Publ. Univ. Nac. Cuzco): 58, Fig. 13, 1956. *Figure 54*.

On shrubby mountain slopes, 2,500–3,700 m. alt. In central and southern Peru.

Plant 9 dm. tall, usually prominently pilose throughout, probably tuber-bearing; tubers unknown; stem erect, slender, maculate; leaves odd-pinnate, up to 40 cm. long, shortly petiolate, provided with several various-sized orbicular or ovate interstitial leaflets, bright green and sparsely pilose with long silvery hairs on the upper surface, dull green and more finely and densely pilose on the lower surface; leaflets 7 or 9, sessile to rather prominently petiolulate, elliptic to elliptic-lanceolate, rounded to subcordate at the oblique base, acute to shortly acuminate at apex, up to 14 cm. long and 5 cm. wide; terminal leaflet only slightly larger than the lateral ones, sometimes elliptic-oblanceolate; pseudostipular leaves prominent, broadly lunate to semi-elliptic, up to 2.5 cm. long; inflorescence pseudoterminal, rather compactly or laxly 10- to 20-flowered, sometimes with minute bracts subtending the branches and scattered; peduncle slender, up to 9 cm. long, furcate; pedicels slender, 1.5–2.5 cm. long, articulate at about the middle; flowers bright lilac to purplish; calyx 6–10 mm. long, divided to below the middle into broadly ovate to subquadrate lobes that are abruptly constricted above the middle to form a linear apical portion, commonly with two lobes more or less united; corolla rotate-pentagonal, 3.5–5 cm. in diameter, the broadly triangular acumens prominent; anthers narrowly lanceolate in outline, 5–8 mm. long; filaments broad, 1.5–2 mm. long, glabrous; style slender, 1.2–1.4 cm. long, glabrous, the stigma slightly thickened; fruit ovoid, about 1.5 cm. long.

This species is closely allied to *S. ambosinum*, and it is quite possible that it should be included in that species. For the present, however, it is kept apart from *S. ambosinum* on the basis of its coarser pubescence, especially in the more compact inflorescence, larger corolla with more pronounced acumens, glabrous style, and pedicels articulate consistently at about the middle.

Cuzco: Prov. Urubamba, between Peñas and Kosñiriti, on slope of thicket, 3,700 m. alt., *Vargas C. 5958*.—Huánuco: roadside near San Rafael, between Cerro de Pasco and Huánuco, *Hodge 6217*.—Indefinite: Muña, trail to Tambo de Vaca, 2,500 m. alt., *MacBride 4298*.

Solanum ambosinum Ochoa, Biota (Lima) 1(1):7, Fig. 3-4. 1954. *S. coelestispetalum* Vargas, Diez Años Servic. Bot. Univ. Cuzco 46. 1946, *nom. nud.*; Las Papas Sudperuanas, Part II (Publ. Univ. Nac. Cuzco): 59, Fig. 15. 1956. *S. Ochoae* Vargas, Las Papas Sudperuanas, Part II (Publ. Univ. Nac. Cuzco): 62, Fig. 21. 1956. *Figure 55*.

Among shrubs in mountains, 2,220–3,600 m. alt. In central and southern Peru.

Plant up to 8 dm. tall, more or less silvery pilose throughout, stoloniferous and tuber-bearing; tubers white, globose to ellipsoid, 3–4 cm. in diameter; stem erect to erect-ascending, branched, commonly pigmented, shortly pilose; leaves odd-pinnate, up to 30 cm. long, shortly petiolate, dark green and shiny pubescent on upper surface, pale grayish green and more densely and finely pubescent on lower surface, provided with few to many several-sized interstitial leaflets; leaflets 7 or 9, rarely 11, prominently petiolulate to subsessile, ovate-elliptic to elliptic or broadly elliptic-lanceolate, subtruncate to cordate or sometimes broadly rounded at the oblique base, obtuse to acute or shortly acuminate at the apex, up to 7 cm. long and 3.5 cm. wide; pseudostipular leaves broadly lunate, up to 1.5 cm. long; inflorescence pseudoterminal and/or lateral, cymosely paniculate, 10- to 24-flowered, finely pilose; peduncle rather stout, up to 7 cm. long, branched above with the branches spreading; pedicels slender, 1.5–3 cm. long, prominently articulate about or well above the middle, often articulate just below the calyx; flowers bright violet-blue to purplish; calyx 7–10 mm. long, divided to below the middle into ovate-lanceolate lobes that are constricted above into a narrowly lanceolate apical portion, pilose; corolla rotate-pentagonal, 3–3.5 cm. in diameter, the acumens short; anthers lanceolate in outline, 4–6 mm. long; filaments 1–2 mm. long, glabrous; style 6–8 mm. long, cellular-papillose below the middle, the notched stigma globose; fruit broadly ovoid to globose, about 1 cm. in diameter.

Cuzco: Chacán, north of Cuzco, 3,600 m. alt., *Vargas C. 4067*. Prov. Urubamba, Salapunco, km. 84 F. C. Cuzco-Santa Ana, among shrubs, 2,400 m. alt., *Vargas 5990*.—Huánuco: Prov. Ambo, between

FIG. 55. *Solanum ambosinum* Ochoa. 1, upper part of flowering plants, note abnormal flowers, × ½; 2, branch with normal flowers, × ½; 3, calyx, spread out, × 1½; 4, corolla, spread out, × 1½; 5, stamen, dorsal view, × 3; 6, pistil, × 3.

FIG. 56. *Solanum aracc-papa* Juz. ex Rybin. 1, flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

Ambo and San Rafael, km. 38 along road from Huánuco to Cerro de Pasco, 2,200 m. alt., *Ochoa 1040*.

Solanum aracc-papa Juz. ex Rybin, Bull. Appl. Bot., Genet., & Pl.-Breed., Leningrad, 2nd. ser. 20: 674. 1929. Without Latin diagnosis; Buk., Bull. Appl. Bot., Genet., & Pl.-Breed., Leningrad, Suppl. 58: 113. 114, Figs. 45–66. 1933; Bull. Acad. Sci. U.R.S.S., ser. Biol. 2: 306. 1937. *Figure 56*.

Plant low and bushy, 1.5–3 dm. tall, stoloniferous and tuber-bearing, sparingly coarsely pubescent throughout; tubers unknown; stem mostly much-abbreviated, flexuous, purplish brown to greenish, often several-branched; leaves more or less rosulate, odd-pinnate, up to 21 cm. long, usually smaller, with numerous several-sized interstitial leaflets; leaflets 7 to 11, rarely 5, sessile to very shortly petiolulate, occasionally clasping the rachis, obovate to broadly elliptic or suborbicular, obtuse to acute at apex, broadly cuneate to rounded or occasionally subcordate at the oblique base, up to 4.5 cm. long and 3 cm. wide; terminal leaflet slightly wider than the lateral ones; pseudostipular leaves semi-orbicular, falcate, about 7 mm. long; inflorescence pseudoterminal on the short stem, 10- to 15-flowered, cymosely paniculate; peduncle slender, 4–6 cm. long, branched above; pedicels slender, 1.5–2.5 cm. long, articulate at about or a little above the middle; flowers violet-color, bluish on back of corolla; calyx 7–9 mm. long, divided to about the middle into triangular-ovate to ovate-lanceolate acute to acuminate or long-apiculate lobes, noticeably coarsely pilose; corolla rotate-pentagonal to rotate-substellate or rarely broadly stellate, about 2.5 cm. in diameter, the lobes often prominent; anthers oblong-lanceolate in outline, 5–6 mm. long; filaments 1.5 mm. long, glabrous; style about 1 cm. long, minutely cellular-papillose below the middle, the stigma globose-thickened; fruit (immature) subglobose to broadly ovoid.

This species shows close relationship with several other species. In habit, it closely resembles *S. Lobbianum* and its *f. multidissectum*, but it lacks the long shaggy hairs on the stem, leaf-rachis and peduncle, as well as the low pedicel-articulation of that species. It also resembles some forms of *S. acaule*, and the leaves sometimes closely approach those of that species. The conspicuous pedicel-articulation and differently shaped corolla, however, easily separate it from that species.

Cuzco: Cerro Huilcacalle near San Sebastian, a ruderal plant, *Juzepczuk 1455*.

Solanum Bukasovii Juz. ex Rybin, Bull. Appl. Bot., Genet., & Pl.-Breed., Leningrad, 2nd ser., 20: 674. 1929. Without Latin diagnosis; Bull. Acad. Sci. U.R.S.S., ser. Biol. 2: 303. 1937. *Figure 57.*

Among rocks on open grassy slopes, banks of rivers and about cultivated fields, 3,300–4,000 m. alt. Central Peru.

Plant low and bushy, up to 3.5 dm. tall, usually much smaller, sometimes essentially acaulescent, stoloniferous and tuber-bearing, more or less finely and densely pubescent throughout with whitish or yellowish sharp curved hairs, often with additional longer hairs on the stem, veins, peduncle and pedicels; tubers unknown; stem usually much-abbreviated, erect or flexuous, branched, conspicuously pubescent; leaves often rosulate, odd-pinnate, up to 25 cm. (usually about 12 cm.) long, without or usually with few to many (often of two types) interstitial leaflets; leaflets 7 to 11, rarely 13, elliptic to broadly elliptic-lanceolate; lateral leaflets sessile to shortly petiolulate, rarely long-petiolulate and with one or several secondary leaflets on the petiolules, obtuse to acute at apex, broadly rounded to rarely cordate at the oblique base, up to 7 cm. long and 3.5 cm. wide (usually about half as large); terminal leaflet larger than the lateral ones, sometimes broadly ovate-elliptic to suborbicular; pseudostipular leaves semi-orbicular, falcate, up to 1.5 cm. long; inflorescence pseudoterminal, 5- to 15-flowered, cymosely paniculate, usually noticeably exceeding the leaves and showy; peduncle erect, stout, elongate, up to 15 cm. long, branched above, heavily pubescent with long hairs; pedicels slender, 1.5–4 cm. long, articulate well above the middle and often within 6 mm. of the calyx, heavily pubescent with long hairs; flowers conspicuously large for the plant, pale violet-color to purplish; calyx 8–10 mm. long, fleshy-thickened, densely pubescent, divided to below the middle into elliptic-lanceolate abruptly acuminate lobes, commonly bilabiate; corolla broadly rotate-pentagonal to rarely rotate-substellate, 2.8–4.5 cm. in diameter, with prominent lobes; anthers 6–8 mm. long, lanceolate in outline; filaments about 2.5 mm. long, glabrous; style about 1 cm. long, cellular-papillose about the middle, the stigma globose and emarginate; fruit (immature) broadly ovoid, up to 1.5 cm. or more long, green, marked with purple.

In habit, this species closely resembles *S. brevicaule.* The constantly high pedicel articulation (commonly within 6 mm. of the calyx) and dissimilar pubescence are two of the characteristics that separate this species from *S. brevicaule.* Its finer and denser pubescence consists of yellowish or whitish thin hairs, while the coarser whitish hairs of *S. brevicaule* are broad and paleaceous.

FIG. 57. *Solanum Bukasovii* Juz. ex Rybin. 1, flowering plant, × ½; 2, calyx, spread out, × 1; 3, corolla, spread out, × 1; 4, stamen, dorsal view, × 3; 5, pistil, × 3; 6, leaf, × ½.

The species is based upon material that was collected in the Cerro de Pasco, Junín Dept., Peru. Plants were later grown from seeds near Leningrad, Russia. A series of collections by Ochoa from the region of Cerro de Pasco, Pasco Dept., compares very well with the type material of *S. Bukasovii*. This species is further discussed under *S. canasense*.

Junín: near Yana Macctachay, in Cerro de Pasco, bank of river, among rocks on edge of cultivated area, *Juzepczuk 10605* (*563*). Along road, Concepción–Santa Rosa de Ocopa, 3,300 m. alt., *Ochoa 56*.—Pasco: Serranías de Condorhuachanan, Hacienda Andachaca, 65 km. from Cerro de Pasco, *Ochoa 23*. Milpo, between Cerro de Pasco and La Quinua, 3,700 m. alt., *Ochoa 31*. La Quinua, near Cerro de Pasco, 3,500 m. alt., *Ochoa 322*. 6 km. along the road from Cerro de Pasco to La Quinua, 3,900 m. alt., *Ochoa 480*.

Solanum canasense Hawkes, Bull. Imp. Bur. Pl. Breed. & Genet., Cambridge 47, 123, Figs. 35–36. *S. Kaufmanii* Buk., Sov. Pl. Ind. Rec. 4: 13. 1940, *nom. nud.* *S. Lechnovichii* Hawkes, Bull. Imp. Bur. Pl. Breed. & Genet., Cambridge 49, 124, Fig. 39. 1944. *S. fragariaefructum* Hawkes, Bull. Imp. Bur. Pl. Breed. & Genet., Cambridge 53, 129, Fig. 47. 1944. *S. canasense* var. *alba* Vargas, Las Papas Sudperuanas (Publ. Univ. Nac. Cuzco) 2: 57, Fig. 10 [erroneously labeled *Solanum calcense* var. *alba*]. 1956. *S. canasense* var. *Lechnoviczii* (Hawkes) Ochoa, Los Solanum Tuberiferos Silvestres del Perú 168, fig. 85. 1963 (dated 1962). *Figure 58*.

Among boulders and rocks, about and on stone walls, grassy places, among shrubs along streams, and in heaps of stones about cultivated fields, 2,000–4,100 m. alt., usually above 2,500 m. Central and southern Peru.

Plant somewhat bushy to erect-ascending, stoloniferous and tuber-bearing, 1.5–5 dm. tall, rather finely and densely adpressed silky pubescent throughout with curved hairs, the stem and leaf-rachises sometimes with long scattered hairs; tubers ellipsoid to globose, up to about 6 cm. long, white or pale brown; stem essentially simple or branched, flexuous to laxly ascending; leaves odd-pinnate, 8–20 cm. long, typically elliptic in outline, usually provided with numerous (occasionally with few) small 2-sized interstitial leaflets, grayish green and more finely and densely pubescent on lower surface than on upper surface; leaflets 7 to 13; lateral leaflets ovate-elliptic to elliptic-lanceolate, strongly oblique at the sessile to shortly or prominently petiolulate base (sometimes with a secondary leaflet on the petiolule), rarely

with the uppermost pair decurrent on the leaf-rachis, subobtuse to shortly acuminate at the apex, 2–6 cm. long, 1.3–3 cm. wide; terminal leaflet similar to the lateral ones but sometimes slightly larger; pseudostipular leaves semi-ovate, falcate, up to about 1.5 cm. long; inflorescence pseudoterminal, 2- to many-flowered, cymosely paniculate; peduncle up to 15 cm. long, rather stout, divided above; pedicels 1.5–3.5 cm. long, articulate at about or mostly well above the middle, pubescent; flowers bluish purple, dusty or deep lavender to whitish with bluish markings, showy; calyx 7–11 cm. long, divided to about or below the middle into ovate-lanceolate to triangular-lanceolate acute to subacuminate lobes, mostly rather coarsely pubescent; corolla rotate-pentagonal, up to 4.5 cm. in diameter, reflexed; anthers lanceolate in outline, 4.5–6.5 mm. long; filaments 1–2 mm. long, glabrous; style 7–12 mm. long, usually minutely cellular-papillose about the middle, the stigma globose and commonly emarginate; fruit yellowish or dark green, often purplish or white-speckled, globose to broadly ovoid, 1.5–2.5 cm. in diameter.

Some of the plants referred to this species closely resemble in habit some plants of *S. leptophyes*. However, besides having a usually larger and more rotate corolla, this species is more finely and densely silky pubescent throughout, especially on the lower surface of the leaves, whereas *S. leptophyes* is coarsely pilose. The calyx-lobes, also, are usually much longer than in that species. The leaves of *S. canasense* are typically more dissected and the pedicels have a consistently higher articulation than in *S. leptophyes*.

Plants included in this species also vary considerably in the size of their leaflets and in the number of interstitial leaflets that are present. Also, those plants grown under cultivation usually have a much more finely divided leaf with smaller segments than those found in nature. The flowers, however, appear to be similar under both environmental conditions.

The plant described as *S. Lechnovichii* has generally narrower leaflets than typical material. These are also more sparsely pubescent on the upper surface than in typical *S. canasense*. There does not appear to be, however, any distinctive characteristic which could maintain the plant as a separate entity.

This species is closely linked to *S. brevicaule*, *S. Lobbianum*, and *S. Bukasovii*, and, through its var. *neohawkesii*, to *S. Abbotianum*. If all of these were placed together as one highly variable species it would probably be to the best interest of science. Notwithstanding, they are here maintained separately because of possible genetical, if

FIG. 58. *Solanum canasense* Hawkes. 1, flowering plant, × ½; 2, calyx, spread out, × 1; 3, corolla, spread out, × 1; 4, stamens, dorsal view, × 2; 5, pistil, × 2; 6, fruits, × ½. *Solanum canasense* var. *neohawkesii* (Ochoa) Corr. 7, mature leaf, × ½; 8, fruit, × ½.

not taxonomic, value. Perhaps further experimental work will resolve and clarify their true status.

Arequipa: near Arequipa, 2,000–2,500 m. alt., *Guenther & Buchtien 1402, 1405, 1414.*—Ayacucho: Prov. Cangallo, Pallcca, between Río Pampas and Ayacucho, 3,200 m. alt., *Balls & Hawkes 6931.* In shelter of boulders along stream, 126 km. from Nazca on road to Puquío, 4,100 m. alt., *Correll & Smith P157.* 35 km. from Puquío on road to Nazca, 3,500 m. alt., among boulders and shrubs in grassland, *Correll & Smith P162.*—Cuzco: Prov. Quispicanchi, near Oropesa, Racchchi, 4,000 m. alt., *Balls & Hawkes 6770.* Ecaira, in meadows and on edge of maize fields, 3,150 m. alt., *Carillo & Ross 782 p.p.* 4 km. from Cuzco on road to Pisac, on gravelly-rocky slopes, 3,600 m. alt., *Correll & Smith P223.* Prov. Cuzco, 7 km. from Cuzco on road to Pisac, 3,900 m. alt., *Rimpau, Ross & Vargas C. 794–795.* Prov. Canas, Río Apurímac, 3,800 m. alt., among rocks, *Vargas 2001.* Prov. Calca, Quebrada de Ccochocc, *Vargas 4087.* Prov. Urubamba, Pumahuanca, in rocky area, 4,300 m. alt., *Vargas 7836.* Prov. Canas, Asuncion Bridge, Apurímac River, on rocky talus slopes, 3,700–3,800 m. alt., *Vargas 11032.*—Junín: among low shrubs and grasses about long low ledges midway between La Oroya and Paccha, 3,750 m. alt., *Correll & Smith P726.* Among boulders, Huari, 3,650 m. alt., *Correll & Smith P728.* Km. 18 on road between Jauja and Tarma, 3,550 m. alt., *Correll & Smith P749.* Among piles of rocks in cultivated fields, Km. 25 on road between Jauja and Tarma, 3,850 m. alt., *Correll & Smith P750.* About ledges and in low shrubs of altiplano, Km. 36 on road between Jauja and Tarma, 4,100 m. alt., *Correll & Smith P752.* At base of ledges along mountain stream near Km. 206 on road from La Oroya to Cerro de Pasco, 3,900 m. alt., *Correll & Smith P788.* Pasos, near Huancayo, 3,100 m. alt., Prov. Huancayo, beyond Huayucachi, *Ochoa 719 p.p.* Huaychulo near Huancayo, along stream, 3,300 m. alt., *Ochoa & Ross 1020 p.p.* Tarma, near Oroya, *Petersen & Hjerting 1337.*—Lima: on open rocky slopes near Culluay, 3,900 m. alt., *Correll, Smith & Ferreyra P297.* On and about ledges above Río Blanco at Km. 110, 3,550 m. alt., *Correll & Smith P722.*—Moquegua: Carumas, rainy-green formation, 3,100 m. alt., *Weberbauer 7257.*—Puno: among boulders on road to Juliaca, 10 km. from Puno, 3,800 m. alt., *Correll & Smith P196 & P197.* Among loose rubble 11 km. from Puno on road to Juliaca, 3,700 m. alt., *Correll & Smith P201.* Prov. Lampa, Muñani, *Vargas 8270.* Between Cerro Llahuini and Cerro Cuaquisa, on puna, 3,800–4,100 m. alt., *Zuñiga 044.*

Solanum canasense var. **calcense** Vargas, Las Papas Sudperuanas (Publ. Univ. Nac. Cuzco) 2: 58, Fig. 11. 1956 (type: Peru, Dept. Cuzco, Prov. Calca, in rocky thicket, quebrada Kochoc, 2,900 m. alt., Feb. 1944, *Vargas 4074*). *S. punoense* Hawkes, Bull. Imp. Bur. Pl. Breed. & Genet., Cambridge 47, 123, Fig. 34. 1944. *S. canasense* var. *intihuatanense* Vargas, Las Papas Sudperuanas (Publ. Univ. Nac. Cuzco) 2: 58, Fig. 12. 1956. *S. Lechnovichii* var. *latifolium* Vargas, Las Papas Sudperuanas (Publ. Univ. Nac. Cuzco) 2: 61, Fig. 18. 1956 (as var. *latifolia*). *S. canasense* var. *latifolia* (Vargas) Ochoa, Los Solanum Tuberiferos Silvestres del Perú 170, fig. 88. 1963 (dated 1962).

The superficial var. *calcense* has larger lateral leaflets and fewer interstitial leaflets than in typical *S. canasense*. It approaches *S. Bukasovii* very closely. The shorter and finer pubescence, especially on the peduncle and pedicels, superficially separate it from that species. The flowers and soft pubescence on the lower surface of the leaves of *S. punoense* place it in *S. canasense*, rather than in *S. sparsipilum* where it has been referred by some authors.

Plants which Smith and I collected (No. P215) at Camacani, Puno Dept., Peru, were large and bushy with enormous showy flowers, among which were a number of double flowers. This plant formed one of the common elements in the vegetation on the mountain slopes above the tree nursery at Camacani.

Cuzco: Quebrada de Pomatalen, 2,900 m. alt., *Barkley 21P027*. Wet brushy slope 9 km. from Pisac on road to Cuzco, 3,400 m. alt., *Correll, Smith & Vargas C. P225 p.p.* Recolecte, Cuzco, on edge of fields, *Correll, Smith & Vargas P241*. Below the ruins of Intihuatana near Pisac, *Ochoa 2059*. Chacán, north of Cuzco, 3,700 m. alt., *Vargas 609*. Rocky area, Intihuatana, Pisac, Prov. Calca, 3,400 m. alt., *Vargas 5065*. Prov. Anta, Totora, within walls, 3,700 m. alt., *Vargas 5875*.—Junín: on brushy stream bank above Concepción, 3,500 m. alt., *Correll & Smith P733*.—Lima: Prov. Huarochirí, vicinity of Estación del Chicla, 3,600 m. alt., *Ochoa 2055*.—Puno: Ilpa Prov., Puno, amongst heaps of stones at edge of potato fields, 3,800 m. alt., *Balls & Hawkes 6620*. In shade of ledge along road 10 km. from Puno on road to Juliaca, 3,800 m. alt., also among boulders along stream, *Correll & Smith P198, P199* and *P200*. Among boulders on mountain slopes above Camacani, 27 km. southeast of Puno, 4,100 m. alt., *Correll & Smith P215*.

Solanum canasense var. **neohawkesii** (Ochoa) Corr., Wrightia 2: 184. 1961. *S. neohawkesii* Ochoa, Rev. Argentina Agron. 19: 231,

Figs. 1–2. 1952 (not Vargas, Diez Años Servic. Bot. Univ. Cuzco 46. 1946, *nom. nud.*). *Figure 58.*

Variety *neohawkesii* is quite similar in habit to typical *S. canasense* although it has a tendency to become more branched and florifer-ous. Because of its attractive habit—combining its delicately and profusely dissected leaves with their marginally undulate leaflets and the showy flowers—it has possibilities as an ornamental plant, especially for border- and mass-plantings.

The plant differs more or less by degrees from typical *S. canasense.* Its leaflets are usually more petiolulate and, as noted above, their margins are undulate and even somewhat pleated, and they are more elliptic or oval with a more or less cordate base and ob-tusish apex.

Ayacucho: in field of cultivated potatoes, 13 km. from Puquio on road to Nazca, 3,800 m. alt., *Correll & Smith P168.* Prov. Lucanas, among rocks on hill in mountains between Puquio and Nazca, 3,600–3,700 m. alt., *Ferreyra 5502.*—Cuzco: Prov. Urubamba, Pumahu-anca, rocky places, 2,900–3,000 m. alt., *Vargas C. 7653.* Sacsahua-mán–Tamborachai, rocky area, *Vargas 10054.*—Huancavelica: grassy places, in mountains of Laria, 8 km. from Conaica, 3,850–3,900 m. alt., *Tovar 896.*—Junín: vicinity of Oroya, in cultivated ground, 3,050–4,260 m. alt., *Kalenborn & Kalenborn 7.* Prov. Yauli, Casa-racra, near Oroya, 3,800 m. alt., *Ochoa 37.* Near Oroya, Casaracra, *Ochoa* (*comm. M. Cárdenas*) *s.n.* Oroya, *Stevens 9.*

Solanum canasense var. **xerophyllum** (Vargas) Corr., Wrightia 2: 185. 1961; Ochoa, Los Solanum Tuberiferos Silvestres del Perú 170, figs. 86–87. 1963 (dated 1962) (as var. *xerophylla*). *S. Lechnovichii* var. *xerophyllum* Vargas, Las Papas Sudperuanas (Publ. Univ. Nac. Cuzco) 2: 61, Fig. 19. 1956 (as var. *xerophylla*).

Variety *xerophyllum* differs from typical *S. canasense* in having the usually dark green, coriaceous and more or less vernicose upper leaf-surface glabrous or with only a few coarse, scattered hairs, and these mostly submarginal. Most of the material also has fewer inter-stitial leaflets than in typical *S. canasense.*

This plant shows a definite relationship with *S. marinasense* and, with further collecting and study, it might prove to be either a nar-row-leaflet variety of that species or a hybrid of that species with *S. canasense.* One of the three plants of an isotype in the Lundell Herbarium has the uppermost pair of lateral leaflets strongly decur-rent on the leaf-rachis.

FIG. 59. *Solanum catarthrum* Juz. 1, branch of flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3; 6, two leaves, × ½.

Cuzco: rocky slope near Calca on road to Pisac, 3,000 m. alt., *Correll, Smith & Vargas C. P229.* On rocky slope of mountain above Urubamba, 3,000 m. alt., *Correll, Smith & Vargas P232.* Along top of old stone wall, Piquillacta, Quispicanchis, 3,200 m. alt., *Correll, Smith & Vargas P238.* Prov. Calca, among rocks and cactus, slope of Tunasmocco, *Vargas 4088.* Prov. Urubamba, slope of Yahuarmaqui, *Vargas 7867.*

Solanum catarthrum Juz., Bull. Acad. Sci. U.R.S.S., ser. Biol. 2: 307. 1937. *Figure 59.*

Plant rather bushy, up to 4.5 dm. tall, usually much shorter, stoloniferous and tuber-bearing, sparsely pilose throughout or sometimes glabrescent; stem rather stout, flexuous to erect, simple or branched near base or below the middle; leaves odd-pinnate, up to 20 cm. long, without or usually with several small interstitial leaflets; leaflets 5 to 9; lateral leaflets elliptic to ovate-elliptic or sometimes obovate-elliptic, broadly rounded to cuneate at the symmetrical or slightly oblique base, broadly obtuse to acute at the apex, shortly petiolulate or sometimes with the uppermost pair slightly decurrent on the rachis, up to 6 cm. long and 3.5 cm. wide; terminal leaflet somewhat larger than the lateral ones; pseudostipular leaves semi-orbicular, falcate, up to about 8 mm. long; inflorescence pseudoterminal, cymosely paniculate, few- to many (14)-flowered; peduncle up to 7.5 cm. long, divided above; pedicels 1–2.2 cm. long, prominently articulate at about to well below the middle or sometimes near the base, pubescent; flowers pale violet-color to bluish purple; calyx 4–6 mm. long, divided to about the middle into broadly ovate to ovate-quadrate apiculate to abruptly short-acuminate lobes; corolla broadly rotate-pentagonal to rarely rotate-substellate, 2.3–3 cm. in diameter, with the acumens usually prominent; anthers lanceolate in outline, 5–6 mm. long, with age often twisted; filaments 1.5–2 mm. long, glabrous; style 8–10 mm. long, minutely cellular-papillose about the middle, the stigma not noticeably thickened; fruit unknown but the ovary is globose-ovoid.

The small calyx, which is similar to that of *S. sparsipilum*, and the low articulation of the pedicels distinguish this plant. The original description was made from plants grown near Leningrad, Russia, from tubers collected at Lucre near Cuzco, Peru.

Cuzco: Lucre near Cuzco, *Kaufman s.n.*

Solanum chancayense Ochoa, Agronomía (Lima) 26: 316, Figs. 1959. *Figure 60.*

FIG. 60. *Solanum chancayense* Ochoa. 1, flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out (note pleats), × 1½; 4, interpetalar tissue, stretched out to show shape, × 1½; 5, stamen, dorsal view, × 3; 6, pistil, × 3.

On rocky hills in the loma region of coastal Peru, 150–400 m. alt., flowering from August to October.

Plant low, bushy, stoloniferous and tuber-bearing, up to 2.5 dm. tall; tubers globose to ovoid, whitish, up to 1.5 cm. long; stem angular, simple or rarely branched, 3–4 mm. thick; leaves odd-pinnate, pale green, essentially glabrous to sparsely pilose, typically without interstitial leaflets, up to 15 cm. long including the short (1.5 cm.) petiole; leaflets 5 or 7, rarely 9; lateral leaflets ovate-lanceolate to elliptic-lanceolate, shortly petiolulate and usually decurrent on the rachis on the basiscopic side at the oblique base, subobtuse to acuminate at apex, up to 6 cm. long and 3 cm. wide; terminal leaflet similar to the lateral ones but larger; pseudostipular leaves lunate, falcate, up to 2 cm. long; inflorescence pseudoterminal, up to 6-flowered; peduncle pale green, up to 3 cm. long, simple or branched above; pedicels 1.5–2.5 cm. long, glabrous to sparsely pilose, articulate at about or above or below the middle; flowers white, usually with a central yellowish star; calyx pale green, 3–5 mm. long, divided to above or about the middle into ovate to broadly rounded apiculate lobes, glabrous to sparsely and laxly pilose; corolla rotate-pentagonal, ample, 2.5–3 cm. in diameter; anthers oblong-lanceolate in outline, about 6 mm. long; filaments about 1 mm. long, glabrous; style stout, 8–11 mm. long, cellular-papillose about the middle, the stigma globose; fruit unknown.

This is one of the unusual species of the loma vegetation area of coastal Peru. In its low, bushy habit it is similar to the Bolivian *S. Gandarillasii*. The relatively large leaves and large pleated corolla for such a small plant are distinctive. In describing *S. chancayense*, Ochoa warned against the possibility of confusing it with *S. immite*. The two species, however, are quite different.

La Libertad: Prov. Trujillo, Dept. Cerro Cabras, tuberous, 350 m. alt., *Lopez M. 1210*.—Lima: Prov. Cañete, loma of Quilmaná, between Lima and Cañete, rocky area, 200–250 m. alt. [doubtless belongs here, but flowers said to be violet-color], *Ferreyra 8022*. Prov. Chancay, Lomas de Chancay, stony hills, 200–250 m. alt., *Ferreyra 8718a*. Prov. Chancay, Lomas de Chancay, between Lima and Huacho, rocky ground, 180–200 m. alt., *Ferreyra & Hjerting 14130*. Prov. Chancay, Lomas Chancay, between Lima and Huacho, rocky quebrada, with *Loasa nitida*, 180–200 m. alt., *Ferreyra & Hjerting 14144*. Prov. Chancay, near Latillo, Lomas de Chancay, 150 m. alt., *Ochoa 1804*. Prov. Lima, on way to los Baños de Churín, vicinity of Lomas de Lachay, 400 m. alt., *Ochoa 1806*.

Solanum espinarense Vargas, Las Papas Sudperuanas, Part II (Publ. Univ. Nac. Cuzco): 60, Fig. 16. 1956. *S. Soukupii* var. *espinarense* (Vargas) Ochoa, Los Solanum Tuberiferos Silvestres del Perú 278, fig. 151. 1963 (dated 1962). *Figure 61.*

Plant large, up to 4 dm. tall, conspicuously pilose throughout; tubers unknown; stem slender, slightly pigmented; leaves odd-pinnate, up to 16 cm. long, shortly petiolate, rarely with one or two minute interstitial leaflets, dark green on the upper surface, pale grayish green on the lower surface; leaflets 9 or rarely 11, shortly petiolulate, the two lowermost lateral pairs usually much reduced in size, elliptic, rounded to broadly cuneate at the oblique base, obtuse to acute at the apex, up to 4.5 cm. long and 2 cm. wide; pseudostipular leaves lunate, mostly less than 1 cm. long; inflorescence pseudoterminal, rather compact, with as many as 15 flowers; peduncle erect, slender, furcate, up to 11 cm. long; pedicels about 2 cm. long, articulate at or somewhat above the middle; flowers purplish blue; calyx 6–8 mm. long, divided to below the middle into ovate to subquadrate lobes that are abruptly constricted above to form a linear-lanceolate apical portion; corolla broadly rotate-pentagonal, 3.5–4 cm. in diameter, the lobes broadly subquadrate; anthers lanceolate in outline, about 6 mm. long; filaments with the free parts somewhat united, about 1.5 mm. long; style slender, 8–12 mm. long, the stigma globose; fruit (immature) broadly ovoid.

This is an attractive species that might be used ornamentally as a border plant. The large purplish blue flowers with broadly subquadrate lobes, similar to those of *S. rhomboideilanceolatum* and *S. Soukupii*, are quite showy.

Cuzco: Prov. Espinar, Hacienda Pokera, 4,500 m. alt., under ledges and cliffs, *Vargas C. 10573.*

Solanum gracilifrons Bitt. ex Engl. Bot. Jahrb., No. 119, 54: 6. 1916. *Figure 62.*

Among opuntias and lantanas on slopes, and along streams, 1900–2,000 m. alt. Known only from Huancavelica Dept., Peru.

Plant erect to erect-spreading, 3–5 dm. tall, stoloniferous and tuber-bearing, glabrous throughout or only slightly glandular-puberulent; tubers whitish, subglobose to pyriform, up to about 3 cm. long; stem slender, leafy, with short internodes, flexuous above; leaves odd-pinnate, conspicuously much-dissected, up to 14 cm. long, broadest above the middle, with numerous several-sized interstitial leaflets; leaflets 13 to 19 or occasionally fewer, shortly petiolulate to sessile,

FIG. 61. *Solanum espinarense* Vargas. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamens, dorsal view, × 3; 5, pistil, × 3.

FIG. 62. *Solanum gracilifrons* Bitt. ex Engl. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 2; 3, corolla, spread out, × 2; 4, stamens, ventral view, showing united filaments, × 3; 5, pistil, × 3; 6, part of fruiting inflorescence, × ½.

narrowly lanceolate, tapering to an acute to subobtuse apex, cuneate to rounded at the oblique base, often somewhat falcate, lightly undulate-pleated on the margins, up to 4 cm. long and 8 mm. wide below the middle; lateral leaflets irregular in length, the lowermost several pairs gradually reduced in size, the central pairs longest and those above the middle only slightly smaller; pseudostipular leaves semi-orbicular-reniform, 1–1.5 cm. long; inflorescence pseudoterminal, few- to several (8)-flowered; peduncle slender, up to 5 cm. or more long; pedicels slender, 1.2–1.5 cm. long, articulate at about the middle; flowers white, sometimes with greenish yellow radiating lines; calyx 4–7 mm. long, divided to below the middle into subquadrate to broadly ovate abruptly acuminate to long-apiculate lobes; corolla rotate-pentagonal to rotate-substellate, 2–2.5 cm. in diameter; anthers elliptic-lanceolate in outline, 4.5–5 mm. long; filaments 1–1.5 mm. long, glabrous; style about 7 mm. long, cellular-papillose below the middle, the stigma clavellate-thickened; fruit globose, yellowish green, 1–1.5 cm. in diameter.

Huancavelica: Prov. Tayacaja, 2 km. north of Hacienda Villa Azul, among opuntias and lantanas, 1,900 m. alt., *Ochoa 990*. Prov. Tayacaja, along stream, Mantaca to Colcabamba, 1,900–2,000 m. alt., *Weberbauer 6472*.

Solanum jaenense Ochoa, Agronomía 27(4): 371. 1960; Los Tuberiferos Silvestres del Perú 207, fig. 108. 1963 (dated 1962) (type: Peru, Dept. Cajamarca, Prov. Jaén, hills of Huascarai, 2,700 m. alt., between Tabaconas and Huancabamba, May 5, 1960, *C. Ochoa 2328*). *S. regularifolium* Corr., Wrightia 2: 194. 1961. *Figure 63*.

On brushy slopes in mountains, 2,150–2,700 m. alt. Central Ecuador to northern Peru.

Plant low and bushy, more or less pubescent throughout, stoloniferous and tuber-bearing; tubers globose, up to 3 cm. in diameter; stem slender, flexuous, mostly undulately winged and with scattered long silvery hairs; leaves odd-pinnate, oblanceolate in outline, without interstitial leaflets, the rachis with scattered long hairs; leaflets 7 to 11, usually 9, very regularly and simply arranged on the rachis, with long coarse hairs on the upper surface, more finely and densely pubescent on the lower surface; lateral leaflets sessile to very shortly petiolulate, the uppermost pairs slightly basiscopically decurrent on the leaf-rachis, elliptic to elliptic-lanceolate, obtuse to subacute at the apex, broadly cuneate to rounded at the oblique base; terminal leaflet only slightly larger than the lateral ones; pseudostipular leaves semi-

FIG. 63. *Solanum jaenense* Ochoa. 1, flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

ovate, falcate, less than 1 cm. long; inflorescence pseudoterminal, several-flowered and racemose; peduncle slender, short, about 2 cm. long, sparingly pubescent; pedicels slender, about 2 cm. long, with scattered long hairs, articulate well above the middle; flowers pinkish lavender; calyx 5–6 mm. long, divided to about the middle into ovate abruptly long-apiculate lobes, rather densely pubescent with long white hairs; corolla rotate-stellate, about 2.5 cm. in diameter; anthers 5–6 mm. long, lanceolate in outline; filaments 1.5–2 mm. long, glabrous; style slender, about 1 cm. long, cellular-papillose on lower half, the stigma only slightly globose; fruit unknown.

The simplicity of this plant is perhaps its most distinctive characteristic. It is a low, compact plant with closely placed leaves that have regularly shaped and arranged leaflets and no interstitial leaflets. The undulately winged flexuous stem and rotate-stellate corolla are also distinctive.

Lambayeque: on brushy bank, 46 km. from Olmos on road to Jaen, 2,150 m. alt., *Correll & Smith P827*.

Solanum leptophyes Bitt., Repert. Sp. Nov. 12: 448. 1913. *Figure 64*.

On stony or gravelly slopes, often associated with acacia-cactus-bromeliad scrub, occasionally about cultivated areas, 2,500–4,000 m. alt. Southern Peru, through Bolivia to northwest Argentina.

Plant small and bushy, erect or spreading-ascending, up to 3 dm. tall, usually much smaller, coarsely pilose throughout, stoloniferous and tuber-bearing; tubers ellipsoid to oval, 2–2.5 cm. long, the skin brownish; stem slender, flexuous, commonly much-branched (especially near the base), sometimes slightly winged; leaves odd-pinnate, 5–15 cm. long, with or without few to rarely many small interstitial leaflets, the petiole up to 3 cm. long; leaflets 7 to 11 or sometimes as many as 16, narrowly or broadly elliptic to ovate-lanceolate or elliptic-lanceolate, obtuse to acute at apex, cuneate to rounded at the oblique base, sessile to shortly petiolulate (2–3 mm.) or somewhat decurrent on the rachis, up to 6 cm. long and 2 cm. wide, usually much smaller; terminal leaflet only slightly (if at all) larger than the lateral ones; pseudostipular leaves lunate, falcate, up to 1 cm. long; inflorescence pseudoterminal on the branches, racemose to cymosely paniculate, usually few-flowered; peduncle 2–5 cm. long; pedicels 1–2.3 cm. long, articulate at about or a little above the middle, usually noticeably dilated into the calyx; flowers showy, bright violet-color or purplish; calyx 6–9 mm. long, green or tinged with purple,

FIG. 64. *Solanum leptophyes* Bitt. 1, plant, × ½; 2, branch from bushy plant, × ½; 3, calyx, spread out, × 1½; 4, corolla, spread out, × 1½; 5, pistil, with two stamens attached at base of ovary (left stamen dorsal view, right stamen ventral view), × 1½.

divided to below the middle into ovate-lanceolate to triangular-lanceolate more or less abruptly acute to acuminate lobes; corolla rotate-substellate to rotate-pentagonal, 1.8–2.8 mm. in diameter, the narrowly triangular acumens up to 5 mm. long; anthers elliptic-lanceolate in outline, 4–7 mm. long; filaments 0.5–1.5 mm. long, glabrous; style 7–10 mm. long, glabrous or cellular-papillose below the middle, the stigma clavellate; fruit globose to ovoid, green, sometimes white-spotted, 1.5–2 cm. long.

Solanum leptophyes is typically a low, bushy plant with usually narrow leaflets and a coarse pubescence. It is allied, especially as to habit, to *S. canasense*, under which species it is discussed in some detail.

Puno: San Pedro de Tiquina, 1953, *Petersen & Hjerting 1054*.

Solanum lignicaule Vargas, Rev. Argentina Agron. 10: 398. 1943; Las Papas Sudperuanas (Univ. Nac. Cuzco) 1: 89. Fig. 34. 1949. *S. Vargasii* Hawkes, Bull. Imp. Bur. Pl. Breed. & Genet., Cambridge 12, 13, 113, Fig. 1. 1944. *S. lignicaule* var. *longistylum* Vargas, Las Papas Sudperuanas (Univ. Nac. Cuzco) 2: 56, Fig. 8. 1956 (type: Peru, Dept. Cuzco, Prov. Urubamba, above Tarapata, in argillaceous calcareous soil, 3,150 m. alt., Feb. 1951, *C. Vargas C. 10051*). *Figure 65.*

On rocky-brushy slopes and about old ruins, 3,000–3,500 m. alt. Southern Peru.

Plant strictly erect or somewhat flexuous above, densely glandular-puberulent or glandular-pilose throughout, up to 6 dm. tall, stoloniferous and tuber-bearing; tubers globose to oval, whitish, up to 3 cm. in diameter; stem simple or several-branched, rather woody (especially below the middle); leaves odd-pinnate, up to 10 cm. long, without or usually with several small interstitial leaflets, yellowish green on the upper surface, much paler on the lower surface; leaflets 5 to 9, shortly petiolulate to sessile, narrowly elliptic to lanceolate, subobtuse to acute or acuminate-attenuate at the apex, cuneate or rounded at the oblique base, the margins frequently slightly revolute, up to 5.5 cm. long and 2 cm. wide; lowermost pair of lateral leaflets much reduced; terminal leaflet slightly larger than the uppermost lateral leaflets; pseudostipular leaves lunate, falcate, up to 1 cm. long; inflorescence pseudoterminal, cymosely paniculate, few- to several (10)-flowered; peduncle up to 5 cm. long, branched above; pedicels 1–1.5 cm. long, articulate somewhat above the middle; flowers yellowish white, sometimes faintly tinged with purple; calyx

FIG. 65. *Solanum lignicaule* Vargas. 1, flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

6–9 mm. long, divided to about or below the middle into lobes that are broadened at the base and abruptly become linear-lanceolate to linear-subspatulate, the lobes acute or subacuminate at the apex; corolla broadly stellate to rotate-stellate, 2–2.5 cm. in diameter, the acumens prominent; anthers 4–4.5 mm. long, oblong in outline; filaments about 1.5 mm. long, glabrous to sparsely puberulent; style 7–9 mm. long, cellular-papillose below the middle, the stigma clavellate and somewhat retuse; fruit globose, 1–1.5 cm. in diameter.

The usually strictly erect habit coupled with its dense vestiture of glandular hairs is distinctive of this species.

Cuzco: ruins of Pisac, 3,800 m. alt., *Blood & Tremelling 175*. On rocky slopes of mountains above Pisac, 3,050 m. alt., *Correll, Smith & Vargas C. P227*. Paruro, Colcha, 2,850 m. alt., calcareous rocks, *Vargas 1539* (*Goodspeed Exp. No. 9730*). Prov. Calca, Intihuatana, Pisac, rocky shelves and slopes, 3,400 m. alt., *Vargas 5070*. Prov. Paruro, Dist. Colcha, Quetepampa, along Río Apurímac, in rocky places and rocky slopes surrounding cultivated fields, 2,800–3,100 m. alt., *Vargas 9730*.

Solanum Lobbianum Bitt., Repert. Sp. Nov. 12: 446. 1913. *Figure 66*.

Among rocks and on old walls, rocky-sandy slopes, and edge of fields, in high mountains, 3,000–4,200 m. alt. Colombia and (especially as *f. multidissectum*) in southern Peru.

Plant small, bushy, less than 2 dm. tall (in nature), stoloniferous and tuber-bearing, rather densely and coarsely pubescent throughout; tubers small, whitish; stem abbreviated, ascending, simple or sparingly branched, provided with long whitish spreading hairs; leaves odd-pinnate, 8–17 cm. long, 3–7 cm. wide, provided with several or usually with numerous two- to several-sized interstitial leaflets, the rachis with long white hairs; leaflets 7 or 9, rarely 11; lateral leaflets ovate to broadly ovate-elliptic, obliquely rounded at the sessile to very shortly petiolulate base, obtuse to abruptly short-acute at the apex, up to 3.5 cm. long and 2 cm. wide, progressively smaller from apex to base of leaf; terminal leaflet usually a little broader (sometimes suborbicular) than the lateral ones; pseudostipular leaves broadly lunate, about 8 mm. long; inflorescence pseudoterminal, several-flowered, paniculate; peduncle up to 12 cm. long, divided above, with long whitish hairs; pedicels 1–2.5 cm. long, articulate well above the middle or just below the calyx; flowers pale blue to purplish; calyx 5–10 mm. long, unequally divided to below the

FIG. 66. *Solanum Lobbianum* Bitt. 1, plant with immature flowers, × ½. *Solanum Lobbianum* var. *multidissectum* (Hawkes) Corr. 2, flowering plant, × ½; 3, calyx, spread out, × 1½; 4, corolla, spread out, × 1½; 5, stamens, showing filaments united, dorsal view, × 3; 6, pistil, × 3; 7, fruits, × ½.

middle into ovate to ovate-lanceolate or triangular-lanceolate acute to shortly acuminate lobes; corolla rotate-pentagonal, reflexed, 2–3 cm. in diameter; anthers 5–7 mm. long, oblong-lanceolate in outline; filaments 1–1.5 mm. long, slender, glabrous; style 7–9 mm. long, the stigma globose; fruit globose to ovoid, somewhat compressed, up to about 2 cm. long.

This species is closely allied to both *S. brevicaule* and *S. Bukasovii*. Under cultivation the usually short stems and leaves become much elongated.

Apurímac: Prov. Andahuaylas, sandy slope, 4,000 m. alt., *Vargas 8678*.

Solanum Lobbianum f. **multidissectum** (Hawkes) Corr., Wrightia 2: 189. 1961. *S. multidissectum* Hawkes, Bull. Imp. Bur. Pl. Breed. & Genet., Cambridge 49, 124, Fig. 38. 1944. *Figure 66*.

Forma *multidissectum* is superficially different from typical *S. Lobbianum* in usually having more numerous two- to several-sized interstitial leaflets.

Apurímac: Prov. Andahuaylas, edge of fields, *Vargas 8690*.—Cuzco: Prov. Espinar, Puento Sto. Domingo, rocky slopes, 3,895 m. alt., *Vargas 5646*. Prov. Espinar, Cuento del Apurímac (Mamamhuaut), 4,200 m. alt., *Vargas 10526*. Prov. Canas, environs of San Andres de Checca, 3,820 m. alt., on old walls, *Vargas 11006*.—Puno: in the vicinity of the railroad station of Aguas Calientes between Cuzco and Puno, 4,100 m. alt., *Ochoa 2028*. Prov. Carabaya, between Macusani and Nuñoa, *Vargas 7138*.

Solanum multiflorum Vargas, Las Papas Sudperuanas, Part I (Publ. Univ. Nac. Cuzco): 93, Fig. 37. 1949 (as *multiflorae*). Without Latin diagnosis; Part II: 55. 1956. *Figure 67*.

In forests, usually along streams, 2,200–2,700 m. alt. Southern Peru.

Plant somewhat bushy and spreading-ascending, up to 3 m. tall, more or less pubescent throughout, sometimes subglabrous, stoloniferous and tuber-bearing; tubers small, oval, depressed, whitish; stem stout, usually much-branched, about 2 cm. thick near base, sulcate, darkly mottled, sparsely pilose; leaves odd-pinnate, up to 32 cm. long, without or rarely with several interstitial leaflets; leaflets 5 or sometimes 7, with petiolules up to 1.5 cm. long; lateral leaflets broadly elliptic to elliptic-lanceolate, rather abruptly acuminate at the apex, rounded to somewhat cordate at the oblique base, up to 12 cm. long

FIG. 67. *Solanum multiflorum* Vargas. 1, upper part of flowering plant, with basal leaf in background, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

and 5.5 cm. wide; terminal leaflet usually somewhat larger than the lateral ones; pseudostipular leaves semi-elliptic, falcate, about 1.5 cm. long; inflorescences pseudoterminal on the branches, cymosely paniculate, up to 100 flowers present; peduncle stout, up to 10 cm. long, pilose, branched above; pedicels up to 2 cm. long, puberulent to very shortly and densely pilose, articulate at about or above the middle; flowers bluish purple or violet-color; calyx 7–9 mm. long, divided to below the middle into lanceolate to ovate-subquadrate acuminate to apiculate lobes; corolla rotate-stellate, the acumens prominent, up to 2.5 cm. in diameter; anthers 6–7 mm. long, linear-oblong in outline; filaments 0.5–1 mm. long, broad, somewhat pilose; style 1 cm. long, cellular-papillose; fruit (immature) conical.

This plant is somewhat intermediate between *S. violaceimarmoratum* and *S. villuspetalum*. The plants are subglabrous to rather densely short-pilose but are never so coarsely long-pilose as in *S. villuspetalum*. They also possess more leaflets than in typical plants of that species. Although included here in series Transaequatorialia, this species might eventually prove to be referable to series Conicibaccata.

Except for being vegetatively larger and for having a rotate-stellate corolla, it is not too unlike the plant described as *S. urubambae*.

Cuzco: in forest below "Pillahuata," Cerro de Cusilluyoc, 2,300–2,500 m. alt., *Pennell 13955*. Machu Picchu, Río Urubamba, burnt-over area in forest, 2,200 m. alt., *Sandeman 3642*. Prov. Calca, Vilcabamba, left bank of Río Yavero, among trees, 2,700 m. alt., *Vargas C. 4062*. Prov. Urubamba, km. 104, F. C. Sta. Ana, along the railroad track, 2,200 m. alt., *Vargas C. 4158*.

Solanum multiinterruptum Bitt., Repert. Sp. Nov. 12: 56. 1913. *Figure 68.*

In grasslands, on steep rocky slopes among grasses and bushes, rainforests, hillsides, along streams, and about stone walls, 3,000–3,800 m. alt. Northern and central Peru.

Plant robust and bushy, up to 18 dm. tall, usually much shorter, densely or sparingly soft-pilose throughout, often more or less glandular, stoloniferous and tuber-bearing; tubers ellipsoid, somewhat compressed, up to 5 cm. long; stem stout, brittle, sometimes with long hairs, somewhat flexuous; leaves odd-pinnate, up to 32 cm. long, very shortly petiolate, provided with numerous several-sized interstitial leaflets, the rachis sometimes with long hairs; leaflets 7 to 13, sessile

FIG. 68. *Solanum multiinterruptum* Bitt. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

to very shortly petiolulate or somewhat decurrent on the leaf-rachis, broadly elliptic to obovate, rarely elliptic-lanceolate, subobtuse to acute-apiculate at the apex, cuneate to broadly rounded at the base, dark green on the upper surface, much paler on the lower surface, the terminal leaflet sometimes slightly larger than the lateral ones, up to 10 cm. long and 6 cm. wide, usually smaller; interstitial leaflets sessile or decurrent on the rachis, suborbicular-elliptic, up to 2.5 cm. long; pseudostipular leaves lunate, falcate, about 1 cm. long; inflorescence pseudoterminal, laxly cymosely paniculate, many-flowered; peduncle mostly elongate, up to 20 cm. long, branched above, puberulent to long-pilose and sometimes glandular; pedicels slender, 2.5–3.5 cm. long, articulate well above the middle or just below the calyx, puberulent to long-pilose and sometimes glandular; flowers bluish or white to violet-color; calyx 6–8 mm. long, divided to below the middle into ovate-lanceolate to lanceolate acuminate lobes, the lobes mostly abruptly constricted at about the middle, usually provided with a few or many long white conspicuous hairs, sometimes glabrous; corolla rotate-pentagonal the acumens often prominent, 3.5–5 cm. in diameter; anthers elliptic-lanceolate in outline, 5.5–7 mm. long; filaments 1.5–3 mm. long, glabrous; style 9–11 mm. long, cellular-papillose above the base, the stigma slender-clavellate; fruit (immature) globose, 1.5 cm. or more in diameter.

The peduncle and pedicels of typical *S. multiinterruptum* are puberulent to shortly pilose, and the pedicels are articulate well above the middle or just below the calyx. The broad, typically obovate-elliptic leaflets, with the uppermost pair of lateral leaflets usually somewhat decurrent on the leaf-rachis, are distinctive.

This is a variable species in regard to its vestiture. The type is essentially a glabrous plant with a few long hairs on the calyx. A series of plants, however, which we collected in the Canta Valley of Lima Dept., Peru, has a glabrous calyx, while still another series we obtained in Ancash Dept., Peru, has their calyces covered with long, silvery hairs. These collections also differ somewhat in the pubescence of their herbage.

Huancavelica: Prov. Castrovirreina, near Córdova, open loma, grassland and moist rock walls, 3,050–3,300 m. alt., *Metcalf 30257*. —Lima: among boulders on open slope above Canta, 3,200–3,400 m. alt., *Correll, Smith & Ferreyra P288–P289* and *P291–P292*. Rock slides and open rocky slopes below Culluay on road to Canta, 3,500–3,600 m. alt., *Correll, Smith & Ferreyra P293–P295*. Among rock fences near Culluay, plants enormous, 3,800 m. alt., *Correll, Smith &*

Ferreyra P296. Prov. Canta, near Canta, rocky ridge, 3,000–3,200 m. alt., *Ferreyra 12953*. Río Blanco, open hillside, 3,000–3,500 m. alt., *Killip & Smith 21757*. Huamantanga, 3,345 m. alt., *McLean s.n.* Capra Cancha, road between Tulhuay and Canta, 3,200 m. alt., *Ochoa 1141, 1142*. Prov. Yauyos, Huancracha, above Tupe, mountain rainforest, 3,300 m. alt., *Tovar 167*.

Solanum multiinterruptum f. **longipilosum** Corr., Wrightia 2: 192. 1961.

Those plants that have long, whitish, lax hairs throughout the plant but primarily on their stems, leaf-rachises, peduncles and pedicels, as well as scattered but noticeable capitate glands, make up this form.

This plant is extremely abundant on steep brushy slopes near Jupash, Ancash Dept., Peru. The natives here, who call the plant "coro," told us that they ate the rather large tubers.

Ancash: on steep brushy slope near Jupash, 3,350 m. alt., *Correll & Smith P950*. On grassy slope of stream bank about Km. 306 on road from Conococha to coast, 3,700 m. alt., *Correll & Smith P976*. Prov. Bolognesi, above Chiquián, on hill on edge of farm, 3,500–3,600 m. alt., *Ferreyra & Cerrate 12131*.

Solanum multiinterruptum var. **machaytambinum** Ochoa, Agronomía (Lima) 27(3): 244, Fig. 1960 (type: Peru, Dept. La Libertad, Prov. Otuzco, between Julcán and Machaytambo, 3,000 m. alt., April 15, 1959, *C. Ochoa 2164*).

This plant differs from typical *S. multiinterruptum* in being less pilose, the first and second pairs of lateral leaflets are equal and the two lower pairs progressively smaller, the leaflets are longer and more lanceolate with longer petiolules, the first pair of leaflets is non-decurrent on the leaf-rachis, the fewer and non-membranaceous interstitial leaflets are oval to elliptic and obtuse at the apex, and the calyx is less pilose with linear-spatulate acumens.

Solanum orophilum Corr., Wrightia 2: 192. 1961. *Figure 69*.

Plant erect-ascending, robust, up to 7.5 dm. or more tall, pubescent throughout and somewhat glandular (especially the inflorescence and lower leaf-surfaces), stoloniferous and probably tuber-bearing; tubers unknown; stem stout, simple or branched, wingless, commonly mottled with purple; leaves odd-pinnate, up to 22 cm. long, with several interstitial leaflets; leaflets 9 or 11; lateral leaflets sessile to very

FIG. 69. *Solanum orophilum* Corr. 1, upper part of flowering plant, × ½; 2, more mature flowering and fruiting inflorescence, × ½; 3, calyx, spread out, × 1½; 4, corolla, spread out (note 6 acumens), × 1½; 5, stamen, dorsal view, × 3; 6, pistil, × 3.

shortly petiolulate, elliptic to elliptic-lanceolate, acute to abruptly short-acuminate at apex, broadly rounded to subcordate at the oblique base, up to 6 cm. long and 2.5 cm. wide, the lowermost pair or pairs much reduced; terminal leaflet only slightly larger than the lateral ones, often rhombic-lanceolate; pseudostipular leaves semi-ovate, falcate, up to 1.5 cm. long; inflorescence pseudoterminal, a many-flowered cymose panicle; peduncle usually short, up to 9 cm. long, branched above, glandular-pubescent; pedicels about 1.5 cm. long, glandular-pubescent, articulate well above the middle; flowers lavender-purple; calyx 7–10 mm. long, glandular-pubescent, divided to below the middle into ovate-subquadrate abruptly long-acuminate lobes, occasionally 6-lobed; corolla rotate-pentagonal or sometimes rotate-sextagonal, rarely rotate-substellate, the acumens rather abruptly narrowed, 2.5–4 cm. in diameter; anthers lanceolate in outline, 6–7 mm. long; filaments about 1 mm. long, glabrous; style about 1 cm. long, glabrous, the stigma capitate; fruit globular, about 1.5 cm. in diameter.

This species superficially resembles *S. violaceimarmoratum*, but its orbicular, not ovoid-conic, fruit readily separates it from that species. It is of interest that some corollas occur which have six instead of the usual five acumens and an extra calyx-lobe which is fused with another.

Ancash: on rocky brushy slope, several km. above Chavín, 3,500 m. alt., *Correll & Smith P971*.

Solanum pascoense Ochoa, Agronomía (Lima) 26: 112, *Figs.* 1959. *S. huarochiriense* Ochao, Los Solanum Tuberiferos Silvestres del Perú 215, fig. 113. 1963 (dated 1962) (type: Peru, Dept. Lima, Prov. Huarochirí, Pachacosa, 3,750 m. alt., near Aguacha, Lima-Huarochirí, April 1960, *C. Ochoa 2308*). *Figure 70.*

Plant erect to erect-ascending, essentially glabrous throughout, up to 6 dm. tall, stoloniferous and tuber-bearing; tubers oval, yellowish white, the eyes superficial, up to 6 cm. long and 3 cm. in diameter; stem simple or branched, pigmented, narrowly winged, 3–4 mm. thick; leaves odd-pinnate, 8–12 cm. long, with or without several small interstitial leaflets, deep green and vernicose on the upper surface, dull green on the lower surface; leaflets 5 to 9; lateral leaflets with only the two uppermost pairs fully developed, shortly petiolulate, ovate to elliptic, rounded to cuneate at base, obtuse to subacute at apex, up to 4.5 cm. long and 2.5 cm. wide; terminal leaflet slightly larger than the lateral leaflets; pseudostipular leaves subauriculate,

FIG. 70. *Solanum pascoense* Ochoa. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1; 3, corolla, spread out, × 1; 4, stamen, dorsal view, × 3; 5, pistil, × 3; 6, leaf from lower part of plant, × ½.

FIG. 71. *Solanum pumilum* Hawkes. 1, flowering plant, × 1; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

about 1 cm. long; inflorescence a 10- to 15-flowered panicle, showy; peduncle up to 6 cm. long, pigmented, branched above; pedicels 2–3 cm. long, articulate well above the middle or just below the calyx; flowers bluish with the acumens purplish; calyx 5–6 mm. long, fleshy-thickened, purplish, divided to about the middle into ovate to triangular-ovate abruptly obtuse to acute or apiculate lobes, the lobes usually with scarious margins; corolla rotate-pentagonal, 3–4.5 cm. in diameter; anthers 6–6.5 mm. long, elliptic-lanceolate in outline, dorsally lobulate in the center at the base; filaments 1–2 mm. long, glabrous, violet-color; style 9–11 mm. long, green, pigmented and slightly cellular-papillose on the lower half; fruit (immature) ovoid-conic.

This species is closely related to *S. multiinterruptum*. It has the general aspect of that species as well as the high pedicel-articulation and large rotate-pentagonal corolla. In spite of these similarities there are dissimilarities equally as strong which set it apart from *S. multiinterruptum*. The leaves lack the numerous several-sized interstitial leaflets and the leaflets, themselves, are shorter and more rounded than in that species. The plants are also essentially glabrous throughout, instead of being lightly pilose, and the anthers have a dorsal lobule in the center at the base. It is quite possible that *S. pascoense* should be considered as being only varietally distinct from typical *S. multiinterruptum*, but for the present it is maintained as a separate entity. With availability of more collections in the future a different interpretation of the plant may become necessary.

I have not seen the type of *S. huarochiriense*, but a study of a photograph of the type and the original description has convinced me that this plant is referable to *S. pascoense*.

Pasco: near La Victoria, on the road from Carhuamayo to Paucartambo, district of Paucartambo, 3,500–3,600 m. alt., *Ochoa 1027*.

Solanum pumilum Hawkes, Bull. Imp. Bur. Pl. Breed. & Genet., Cambridge 47, 124, Fig. 37. 1944. *Figure 71*.

On rocky-grassy slopes, brushy areas, in meadows along streams, and about boulders and ledges in puna country, 3,500–4,000 m. alt., rarely lower. Central and southern Peru at high elevations.

Plant small, subrosulate, less than 1.5 dm. tall, stoloniferous and tuber-bearing, rather coarsely pubescent throughout and commonly provided with long lax hairs; tuber solitary; stem greatly abbreviated to almost lacking, with long lax hairs; leaves odd-pinnate, more or less rosulate, 3–10 cm. long, without or sometimes with several small

interstitial leaflets; leaflets 5 or 7; terminal leaflet broadly rhombic-ovate to suborbicular, broadly cuneate at base, subobtuse to acute at the apex, up to 4.5 cm. long and 3.5 cm. wide; lateral leaflets conspicuously smaller than the terminal one, sessile, elliptic, obtuse to acute at the apex; pseudostipular leaves very small or lacking, up to about 5 mm. long; inflorescence pseudoterminal, racemose or briefly paniculate, 1- to 6-flowered; peduncle up to 7 cm. long, divided above; pedicels 1.5–2.5 cm. long, articulate near or mostly well above the middle; flowers purplish, large for the plant; calyx 5–7 mm. long, divided to about the middle into ovate-lanceolate acute to acuminate lobes; corolla rotate-pentagonal to rotate-substellate, reflexed, 2–3.2 cm. in diameter; anthers 5–5.5 mm. long, oblong-lanceolate in outline; filaments about 1 mm. long, glabrous; style about 8 mm. long, usually papillose about the middle, the short stigma capitate; fruit unknown.

This plant is characterized by its greatly abbreviated stem, essentially rosulate leaves, and large terminal leaflet. The high pedicel-articulation sets it apart from the somewhat allied *S. oplocense*. It has some of the characteristics of *S. canasense*, and some specimens might be considered to be miniature plants of that species.

Apurímac: Prov. Grau, summit of Cotabambas, brushy slope, 3,750 m. alt., *Vargas C. 5780*.—Arequipa: near Arequipa, 2,200–2,500 m. alt., *Guenther & Buchtien 1409*.—Ayacucho: in grassy sandy meadow along stream, 90 km. from Nazca on road to Puquío, 3,900 m. alt., *Correll & Smith P153*. Prov. Lucanas, between Puquío and Nazca, among rocks, 3,400–3,500 m. alt., *Ferreyra 5515*.—Cuzco: in turf, open hillside, Cuzco, 3,700 m. alt., *Stafford 1243*. Prov. Espinar, "Río Salado" encampment, rocky slides near arroyo, 3,940 m. alt., *Vargas 5645*. Prov. Canchis, slopes of Sicuani, among herbs and mosses, 3,700–3,800 m. alt., *Vargas 9839 p.p.*—Huancavelica: quebradas westward from Huancavelica, crevices among boulders and cliffs in high puna country, 3,900 m. alt., *Stork & Horton 10841*. Among grasses, Ccaullapa (Jaullapa), about 5 km. from Conaica, 3,900–4,000 m. alt., *Tovar 221*.—Junín: Prov. Yauli, Caripa, at km. 213 on road from Lima to Cerro de Pasco, via Oroya, 3,800 m. alt., *Ochoa 1008*.—Lima: open hillside, Río Blanco, 3,000–3,500 m. alt., *Killip & Smith 21723*.

Solanum rhomboideilanceolatum Ochoa, Rev. Argentina Agron. 19: 234, Figs. 3–4. 1952. *Figure 72*.

In grassy areas among shrubs on slopes and among boulders and rocks in valleys and gorges of high mountains, 2,900–3,500 m. alt. North-central Peru.

Plant up to at least 7 dm. tall, commonly bushy and straggly, stoloniferous and tuber-bearing, pubescent throughout; tubers small, white, globose, up to 1.5 cm. in diameter; stem mostly branched near base, purplish; leaves odd-pinnate, up to 15 cm. long, with or without very few small interstitial leaflets; leaflets 5 to 9, mostly shortly petiolulate but usually with the petiolule winged and often decurrent on the leaf-rachis, rhombic-lanceolate to elliptic-lanceolate or elliptic, cuneate at the base, subobtuse to acute at apex; upper pair of lateral leaflets up to 4.5 cm. long and 2 cm. wide, the succeeding pairs noticeably reduced in size; terminal leaflet usually much larger than the adjacent lateral pair; pseudostipular leaves lunate to obliquely elliptic, up to 1 cm. long; inflorescence pseudoterminal or lateral, 5- to 10-flowered, compactly paniculate; peduncle up to 14 cm. long, stout, branched above; pedicels 2–3 cm. long, articulate well above the middle or just below the calyx, densely pubescent with coarse hairs; flowers violet purple; calyx 8–10 mm. long, divided to about or below the middle into ovate-lanceolate lobes that are abruptly constricted above to form a narrowly acuminate apical portion, purplish, coarsely pubescent; corolla broadly rotate-pentagonal, 3–5 cm. in diameter; anthers narrowly lanceolate in outline, 6–7 mm. long; filaments 1.5–2 mm. long; style 10–12 mm. long, minutely cellular-papillose on the lower third, the stigma globose and notched; fruit globose-ovoid to subglobose, about 2 cm. long, green.

This species is distinguished by its large corolla with the free part of the lobes quadrate, the frequently rhombic-lanceolate leaflets, and the coarse somewhat setaceous pubescence.

Junín: Prov. Huancayo, Pahual, near Chirifruta, on road toward Pariahuanca, 2,900 m. alt., *Ochoa 1394*. Prov. Huancayo, vicinity of Pahual, near Chirifruta, *Ochoa 1395*.

Solanum rhomboideilanceolatum var. **ancophilum** Corr., Wrightia 2: 195. 1961.

The var. *ancophilum* differs from typical *S. rhomboideilanceolatum* in being more densely pubescent and in frequently having shorter leaves with narrower leaflets. Otherwise, the flowers and general characteristics of the plant are quite similar in the two entities.

Ancash: in grassy areas among shrubs on road from Yungay to Llanganuco, 3,300 m. alt., *Correll & Smith P954*. Among large

FIG. 72. *Solanum rhomboideilanceolatum* Ochoa. 1, two sections of upper part of flowering plant, × ½; 2, calyx, spread out, × 1; 3, corolla, spread out, × 1; 4, stamen, dorsal view, × 2; 5, pistil, × 2; 6, leaf, × ½; 7, fruiting branch, × ½.

boulders in gorge of glacial valley on northwest slope of Nevada de Huascarán, below Llanganuco, 3,500 m. alt., *Correll & Smith P957*. On bank along road between Huaraz and Recuay near Km. 383, 3,250 m. alt., *Correll & Smith P965*.

Solanum Soukupii Hawkes, Bull. Imp. Bur. Pl. Breed. & Genet., Cambridge 46, 122, Fig. 33. 1944. *Figure 73*.

Among rocks in shade on hills in mountains, about 3,800 m. alt. Southern Peru.

Plant erect-ascending, up to at least 5 dm. tall; tubers small, pale yellowish brown, ellipsoid, up to about 3 cm. long; stem slender, mostly provided with long whitish hairs, commonly irregularly winged and with hairs arising singly or in tufts from the wings; leaves odd-pinnate, elliptic to elliptic-oblanceolate, 6–10 cm. long, densely pubescent on both surfaces, usually with numerous interstitial leaflets, the rachis commonly with long whitish hairs; leaflets 9 to 13, sessile or very shortly petiolulate; lateral leaflets elliptic to elliptic-lanceolate, subobtuse to acute at the apex, rounded to broadly cuneate at the oblique base, up to 2.5 cm. long and 1.3 cm. wide; terminal leaflet similar to or only slightly larger than the lateral ones; pseudostipular leaves obliquely elliptic, falcate, about 7 mm. long; inflorescence pseudoterminal on the branches, 3- to 9-flowered; peduncle 2–5 cm. long, furcate above; pedicels 1.5–2 cm. long, articulate above the middle; flowers purple to violet-purple or deep lavender; calyx 7–9 mm. long, divided to about or below the middle into ovate-lanceolate abruptly constricted lobes, commonly bilabiate; corolla broadly rotate-pentagonal, 3–4 cm. in diameter, the individual petals truncated to rounded or broadly subcordate and apiculate at the apex; anthers 5–6 mm. long, oblong-lanceolate in outline; filaments 1–2 mm. long, glabrous; style 8–11 mm. long, cellular-papillose on the lower half, the stigma globose; fruit ovoid to broadly ovoid-cordate, pale green marked with purple, about 2 cm. long.

In its habit and rather finely and densely pubescent leaves, *S. Soukupii* resembles *S. canasense*. The larger corolla with lobes that are truncate to rounded or broadly subcordate and apiculate at the apex, however, separate it from that species. The leaflets are also usually more sessile in this species. The two are, unquestionably, closely related. The scattered long, lax, whitish, often multiple, hairs on the stem, leaf-rachis and, to some extent, on the peduncle shows its relationship to *S. Lobbianum*. The corolla, however, is quite different in the two species.

FIG. 73. *Solanum Soukupii* Hawkes. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 2; 3, corolla, spread out, × 1; 4, individual petal, spread out, × 1; 5, stamen, dorsal view, × 2; 6, pistil, × 2; 7, fruits, × ½.

Puno: amongst rocks in damp shade situation, Granja Taller, Escolar de Puno, *Balls & Hawkes 6666*. Near Puno, hills behind Granja Taller, Escolar de Puno, 3,850 m. alt., *Balls & Hawkes 6667*. Hills behind the Granja Taller, Escolar de Puno, Puno, 3,825 m. alt., *Balls & Hawkes 6668*.

Solanum sparsipilum (Bitt.) Juz. & Buk. *ap.* Buk. in Vavilov, Theor. Bases Pl. Breed. 3: 11. 1937. *S. calcense* Hawkes, Bull. Imp. Bur. Pl. Breed. & Genet., Cambridge 53, 128, Fig. 46. 1944. *S. membranaceum* Vargas, Las Papas Sudperuanas, Part II (Publ. Univ. Nac. Cuzco): 62, Fig. 20. 1956. *Figures 74, 75.*

On stony hillsides, grassy banks, along streams, about cultivated fields, and on stone walls, 2,400–4,500 m. alt. Southern Peru and Bolivia.

Plant rather large, up to 15 dm. tall, usually much smaller, stoloniferous and tuber-bearing, subglabrous to sparsely or sometimes rather densely pilose throughout with coarse hairs; tubers ovoid, compressed, brownish, 2–4 cm. long; stem stout, erect to erect-ascending, subsimple to much-branched, lightly winged, more or less flexuous; leaves odd-pinnate, commonly large and flaccid, dark green on the upper surface, light green on the lower surface, up to 3.5 dm. long, with or without several small interstitial leaflets or (in var. *llallaguanianum*) numerous interstitials; leaflets 5 to 11, essentially sessile to prominently petiolulate (up to 1.8 cm. long), the petiolule often winged on the basiscopic side with the wing long and narrowly decurrent on the leaf-rachis, ovate-elliptic to broadly elliptic, obtuse to rather abruptly acute to short-acuminate at apex, broadly cuneate or rounded to subcordate at the base, 3–10 cm. long, 2–6 cm. wide; terminal leaflet sometimes slightly larger than the lateral ones; pseudostipular leaves semi-orbicular, falcate, up to 1.5 cm. long; inflorescence pseudoterminal, cymosely paniculate, few- to 15-flowered; peduncle 3–10 cm. long, divided above; pedicels slender, 1–2.5 cm. long, noticeably articulate above the middle, pubescent; flowers whitish to pale or dark violet-color or bluish; calyx 3–9 mm. long, densely pubescent, regularly to irregularly (bilabiate) divided to about or below the middle into broadly rounded apiculate lobes, with the rounded margins pellucid and the apicule short or long-attenuate; corolla rotate-pentagonal or rotate-substellate to occasionally rotate-stellate, reflexed, 2–3 cm. in diameter, the acumens often prominent; anthers 4–6 mm. long, lanceolate-elliptic in outline; filaments 1–2 mm. long, glabrous; style 8–11 mm. long, essentially glabrous to

papillose about the middle, with the stigma globose; fruit deep green, compressed, globose to ovoid, up to 2 cm. in diameter.

To some extent, this entity serves as a catch-all for what appears to be a common and rather variable "weedy" species.

Cuzco: Prov. Calca, near Calca, Urco farm, 3,350 m. alt., *Balls & Hawkes 6744*. Near Calca, on stone walls and along roadsides, 3,000 m. alt., *Correll, Smith & Vargas C. P230 p.p.* Grassy shaded bank between San Geronimo and Sailla, *Correll, Smith & Vargas P239*. Along railroad embankment near Ollantaitambo, *Correll & Smith P260*. Prov. Calca, Hda. "Urco," *Vargas 4854*. Prov. Urubamba, maize fields, 2,800 m. alt., *Vargas 7071*. Prov. Acomayo, Acos, cultivated country, 3,150 m. alt., *Vargas 7082*. Prov. Urubamba, Pumahuanca, stony slope, scarce, 2,900 m. alt., *Vargas 7595*.

Solanum sparsipilum var. **llallaguanianum** (Card. & Hawkes) Corr., The Potato and its Wild Relatives 465. 1962. *S. calcense* var. *urubambae* Vargas, Las Papas Sudperuanas, Part II (Publ. Univ. Nac. Cuzco): 57, Fig. 9 (as var. *urubambense*). 1956.

Variety *llallaguanianum* appears to grade into typical *S. sparsipilum*, and some of the collections studied are distinctly intermediate between the two. Characteristic specimens of var. *llallaguanianum* usually have a rotate-substellate to rotate-stellate corolla and an irregularly lobed, often bilabiate, calyx whose abruptly constricted lobes are mostly noticeably attenuate above. Vegetatively, var. *llallaguanianum* differs little from typical *S. sparsipilum* except for its usually more numerous interstitial leaflets, and occasionally secondary leaflets.

The plant described as *S. calcense* var. *urubambae* has more dissected leaves with more interstitial leaflets and longer petiolulate lateral leaflets than in most of the material seen. I can find no other difference to maintain it separately.

Cuzco: on rocky bank 4 km. west of Urubamba, 2,900 m. alt., *Correll, Smith & Vargas C. P231*. Phiri, 2,800 m. alt., *Vargas C. 9824*.

Solanum villuspetalum Vargas, Las Papas Sudperuanas, Part I (Publ. Univ. Nac. Cuzco): 92, Fig. 36. 1949 (as *S. villuspetala*); Part II: 54. 1956. *Figure 76*.

In mountain valleys at about 2,500 m. alt. Southern Peru.

Plant erect, up to 1 m. tall, much-branched, densely pilose throughout with silky yellowish hairs; tubers (if present) unknown;

FIG. 74. *Solanum sparsipilum* (Bitt.) Juz. & Buk. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3; 6, calyx, spread out, × 1½.

FIG. 75. *Solanum sparsipilum* (Bitt.) Juz. & Buk. 1, upper part of flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

stem stout; leaves odd-pinnate or rarely simple, without interstitial leaflets, up to 28 cm. long; leaflets 3 or 5, rarely 7 (when not simple), subsessile to shortly petiolulate, broadly ovate to elliptic, abruptly acute to short-acuminate at the apex, rounded to lightly cordate at the usually oblique base, up to 13 cm. long and 10 cm. wide, the terminal leaflet larger than the lateral ones, the lower pair of lateral leaflets usually much reduced; pseudostipular leaves semi-ovate, slightly falcate, up to 2 cm. long; inflorescence pseudoterminal on the branches, with 15 or more flowers; peduncle stout, up to 8.5 cm. long, bifurcate above, densely pilose; pedicels rather stout, up to 2 cm. long, articulate at about the middle, densely pilose; flowers dark blue; calyx strongly irregularly lobed, up to 1 cm. or more long, the lobes elliptic and then abruptly attenuate; corolla rotate-stellate, about 2.5 cm. in diameter, the prominent lobes triangular-lanceolate; anthers elliptic-lanceolate in outline, 6.5–7 mm. long, the pores conspicuous; filaments 0.5–1 mm. long, hirsute, firmly united in a crown that is adnate to the corolla; style 8 mm. long, cellular-papillose on the lower half; fruit unknown; ovary prominently oval.

This is a densely pilose plant of coarse texture. Its usually prominent 3-leaflet aspect and rotate-stellate corolla are its distinguishing characteristics.

Cuzco: March 1943, *Cárdenas 3512*. Prov. Urubamba, Huiñaihuaiña, "Andenes de la Cuidadela," 2,500 m. alt., *Vargas C. 4131*.

Series 14. TUBEROSA

Tuberosa Rydb., Bull. Torrey Bot. Club 51: 146, 147. 1924, as to name only; Buk. & Kameraz, Bases of Potato Breeding 18. 1959, *s. str.*

Plants usually bushy and much-branched, coarsely pubescent, stoloniferous and tuber-bearing; stem stout, the internodes commonly short; leaves ample, odd-pinnate; leaflets mostly large and broad, with the terminal leaflet typically somewhat larger than the lateral leaflets; pedicels usually articulate at about or well above the middle, rarely articulate near or at the very base; calyx-lobes mostly long-acuminate; corolla rotate to rotate-substellate; anthers often abortive to sterile (*fide* Bukasov) and frequently dorsally lobulate at base; filaments broad; stigma often noticeably enlarged; fruits (when present) globose to subglobose.

Although the plants that comprise this series are essentially littoral or coastal, it does, in my opinion, include the solely montane species, *S. tacnaense* and *S. medians* var. *autumnale*. They are bushy,

FIG. 76. *Solanum villuspetalum* Vargas. 1, upper part of flowering plant, with basal leaf in background, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, ventral view to show large pores, × 3; 5, pistil, × 3.

commonly branched plants that are invested, at least in part, by coarse hairs. The leaflets are characteristically broad with the terminal one mostly noticeably larger than the lateral leaflets.

Mostly in the loma vegetation zone of coastal Peru and in coastal Chile, extending into the mountains from north-central Peru to Bolivia, rare in the province of Mendoza and in Patagonia, Argentina.

Distribution in the loma vegetation zone of coastal Peru, below 900 m. alt.

Terminal leaflet only slightly larger than the adjacent lateral pair (these decurrent on the leaf-rachis); anther dorsally trilobulate at base; known only from Arequipa Department.

S. Weberbaueri.

Terminal leaflet noticeably larger than the adjacent lateral pair (which may be only slightly decurrent on the leaf-rachis); anther dorsally minutely quadrilobulate at base; known only from Lima Department.

Leaves without interstitial leaflets; typically with a 3-leaflet aspect.....*S. medians.*

At least some leaves with interstitial leaflets; leaflets usually 5 or more.....*S. medians* f. *neoweberbaueri.*

Distribution in the mountains of Peru and Bolivia, above 1,800 m. alt.

Lateral leaflets not noticeably decurrent on the leaf-rachis; known only from Ancash and Lima departments, Peru.

S. medians var. *autumnale.*

Lateral leaflets (at least the uppermost pair) strongly decurrent on the leaf-rachis; distribution southern Peru and Bolivia.

Leaflets typically elliptic-lanceolate; uppermost pair of lateral leaflets long-decurrent on the leaf-rachis.

S. tacnaense var. *Sandemanii.*

Leaflets typically rhombic-ovate; uppermost pair of lateral leaflets sessile or broadly and shortly decurrent on the leaf-rachis.

Lateral leaflets scarcely more than sessile.....*S. tacnaense.*

Lateral leaflets broadly decurrent on leaf-rachis.

S. tacnaense f. *decurrentialatum.*

Solanum medians Bitt., Repert. Sp. Nov. 11: 366. 1912. *Figure 77.*

Typical *S. medians* and its f. *neoweberbaueri* are apparently confined to the loma vegetation zone of coastal Peru from near sea level

FIG. 77. *Solanum medians* Bitt. 1, flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

up to 600 m. alt., and they flower in July and August; the var. *autumnale* occurs in the mountains of central Peru, probably endemic to Lima Dept., at from 1,800 to nearly 4,000 m. alt., and it flowers during March and April.

Plant bushy and robust, often much-branched, up to 6 dm. or more tall, spreading-ascending, more or less coarsely pilose throughout, stoloniferous and tuber-bearing; tubers irregular, globose to ellipsoid, up to 4 cm. long and 1.5 cm. in diameter, the skin yellowish white; stem weak or rather stout, somewhat brittle, flexuous, sparsely long-pilose to essentially glabrous, sometimes reddish; leaves odd-pinnate, dark green, up to 22 cm. long, with or without several interstitial leaflets; leaflets 3 to 7, rarely more, rather sparsely coarse-pilose on the upper surface, more finely and densely pilose on the lower surface, sometimes soon glabrescent, the margins sinuately pilose-denticulate; lateral leaflets broadly elliptic to elliptic-lanceolate, subobtuse to rather abruptly acute, rounded or cuneate at the very oblique base and sessile to shortly petiolulate, sometimes slightly decurrent on the leaf-rachis (especially the uppermost pair), up to 8.5 cm. long and 5.5 cm. wide; terminal leaflet slightly to conspicuously larger than the uppermost pair of lateral leaflets, elliptic to suborbicular or somewhat broadly obovate-elliptic, acute to abruptly acute-attenuate at apex, rounded to cuneate at the often oblique base, up to 10 cm. long and 6 cm. wide; pseudostipular leaves broadly and obliquely lunate, falcate, up to 2 cm. long; inflorescence pseudoterminal or lateral, cymosely paniculate, up to 12-flowered; peduncle 3–12 cm. long, widely branched above, pilose to puberulent or sometimes subglabrous, occasionally glandular; pedicels 3–4 (rarely 5) cm. long, densely pilose (with white paleaceous hairs) to subglabrous or puberulent, sometimes glandular, prominently articulate within about 5 mm. of the calyx, dilated into the calyx; flowers purple or violet-color to dark blue; calyx 5.5–13 mm. long, purple-tinged, divided to well below the middle into lanceolate or short ovate lobes that are soon abruptly constricted to form elongated linear-lingulate lobules, the lobules up to 2 mm. wide, usually heavily invested with long coarse whitish hairs; corolla rotate-pentagonal to rarely broadly rotate-stellate, 2–3.5 cm. in diameter, the acumens prominent or short and narrow; anthers elliptic-lanceolate in outline, 4–6 mm. long, usually dorsally minutely quadrilobulate at the base; filaments 1–1.5 mm. long, glabrous; style 8–10 mm. long, slender, cellular-papillose below the middle or sometimes glabrous (in var. *autumnale*), the stigma slender-clavellate; fruit globose, 1–1.5 cm. in diameter.

Plants comprising the type collection have suborbicular terminal leaflets that are much broader than the adjacent pair of lateral leaflets. The lateral leaflets, of which there are typically only the upper large pair and a minute basal pair, are supported by short naked or narrowly winged petiolules. The leaf mostly has a 3-leaflet aspect and does not possess interstitial leaflets. The pair of minute, dorsally placed lobules at the base of the anther is of interest. (cf. discussion under *S. Weberbaueri*.)

Lima: 1868–1871, *Dr. Barranca 208 p.p.* (cf. *S. Wittmackii*). From hills at Chorillos, *Maclean s.n.* Hills of Mongomarca, Loma formation (Cerro de Amancaes), 500–600 m. alt., *Weberbaueri* (*Seler 260*) *5683*.

Solanum medians var. **autumnale** Corr., Wrightia 2: 190. 1961. *S. medians* var. *angustifoliolum* Ochoa, Los Solanum Tuberiferos Silvestres del Perú 242, figs. 132–134. 1963 (dated 1962).

Although the leaves of var. *autumnale* usually have the 3-leaflet aspect of typical *S. medians*, they may have as many as four pairs of lateral leaflets. The leaflets are, on the whole, narrower than in typical material and the styles are usually glabrous.

It is quite possible that var. *autumnale* represents the northern extension of a montane linkage between the southern *S. tacnaense* complex and the *S. medians* complex centered in Lima Department, Peru. There is no question, whatsoever, concerning the close interrelationship of these two groups of plants. It resolves itself into the necessity of recognizing some rather poorly defined entities or grouping them into a single, highly variable, widespread megaspecies.

The autumn (Southern Hemisphere), instead of spring, flowering period of var. *autumnale* during March and April, and its occurrence at from 1,800 to nearly 4,000 meters altitude, instead of in the loma vegetation zone are noteworthy differences.

Ancash: on gravel slide several km. below Jupash, 3,050 m. alt., *Correll & Smith P949*.—Lima: on rocky ledges and among boulders near Km. 80 below Canta on road to Lima, 2,200 m. alt., *Correll, Smith & Ferreyra P282*. On ledges along river below Canta, 2,475 m. alt., *Correll, Smith & Ferreyra P283*. On rocky brushy slopes above Canta, 2,850 m. alt., *Correll, Smith & Ferreyra P285*. Prov. Huarochirí, near San Mateo, along road between Lima and Huancayo, rocky slopes, 2,800–2,900 m. alt., *Ferreyra 6961*. Prov. Canta, Canta, 2,600 m. alt., *Ferreyra 9000*. Prov. Canta, near Canta, rocky hills, 2,700–2,800 m. alt., *Ferreyra 12948*. Prov. Huarochirí, Viso, in

humus with much sand, base of cliff, 2,800 m. alt., *Goodspeed, Stork & Horton 11525*. Prov. Huarochirí, valley of Río Rímac, at Km. 81 east of Lima on highway to La Oroya, dry open hillside, loose gravel, shallow soil, 2,250 m. alt., *Goodspeed & Metcalf 30231*. Prov. Huarochirí, valley of Río Rímac, in moist crevices of rock walls, at Km. 70 east of Lima on highway to La Oroya, 1,850 m. alt., *Goodspeed 33116*. In thicket among large rocks, 2,500 m. alt., *MacBride & Featherstone 193*. San Mateo, 1832–1854, *Maclean s.n.* Prov. Huarochirí, on ridge of a hill near Matucana, Km. 76 from Lima to La Oroya, 2,200 m. alt., *Ochoa 691*. Cabra Marca, near Canta, Prov. Canta, 2,700–2,800 m. alt., *Ochoa 1155*. Surco, 2,034 m. alt., *Soukup 3712*. —Indefinite: among rocks in the Andes near *Chicla* country, *Ball s.n.*

Solanum medians f. **neoweberbaueri** (Wittm.) Corr., Wrightia 2: 191. 1961. *S. neoweberbaueri* Wittm., Engl. Bot. Jahrb. 50 (Suppl.): 540, Figs. 1–2. 1914. *Figure 78.*

S. medians f. *neoweberbaueri* is quite similar to the typical form. The upper pair of lateral leaflets, however, have broadly winged petiolules that are somewhat decurrent on the leaf-rachis and the peduncle and the pedicels are less pubescent. The leaves also often have one or more small interstitial leaflets.

Lima: sandy hills of Lima, common, 1862, *Nation s.n.* Among loose scree that had collected on hillside, San Bartolo, about 7 km. inland, 300 m. alt., *Saunders 161*. Cerro Agustinos, *Soukup 2551*. Morro Solar near Chorillos, loma formation, 250 m. alt., *Weberbauer 5689*.

Solanum tacnaense Ochoa, Agronomía (Lima) 18: 133, Figs. 5–6. 1953 (reprint: pp. 19, 21 and 22, Figs. 5–6). *Figure 79.*

In open mixed formations of various shrubs, including Leguminosae and Cactaceae, ravines, and among boulders and rubble of talus slopes, 2,200–3,200 m. alt. Southern Peru and Bolivia.

Plant short and bushy to weakly erect or spreading-ascending, up to 6 dm. or more tall, coarsely and densely pilose throughout, stoloniferous and tuber-bearing; tubers globose, whitish, up to about 1 cm. in diameter; stem slender or stout, sinuous, more or less branched; leaves odd-pinnate, up to 22 cm. long, shortly petioled, with or without interstitial leaflets; leaflets 5 or 7, rarely 3 or 9, light green and sparsely pilose on the upper surface, paler and more densely pilose on the lower surface, the margins crenulate and pilose-denticulate, usually with at least the upper pair of lateral leaflets strongly decurrent

FIG. 78. *Solanum medians* f. *neoweberbaueri* (Wittm.) Corr. 1, flowering branch, about × 1; 2, tip of petal, much enlarged; 3, greatly enlarged hairs from tip of petal; 4, calyx, natural position, × 4; 5, pistil, × 4 (*re-drawn from Wittmack*).

on the leaf-rachis, up to 8 cm. long and 3.5 cm. wide, rhombic-ovate to narrowly elliptic-lanceolate or rarely elliptic-oblanceolate; lateral leaflets broadly rounded to narrowly or broadly cuneate at the base, obtuse to acute or abruptly short-acuminate at apex; terminal leaflet usually only slightly larger than the lateral ones; pseudostipular leaves narrowly to broadly lunate, up to 1.5 cm. long; inflorescence pseudoterminal, erect, cymosely paniculate, up to 25-flowered; peduncle stout or weakly flexuous, up to 15 cm. long, branched above, sometimes with several small leaves on the branches, white-pilose; pedicels slender, elongate, 2–3 (rarely to 4) cm. long, articulate well above the middle or to within 6 mm. of the calyx, rarely basally articulate, white-pilose and somewhat glandular; flowers bright violet-color or rich purple, showy; calyx 7–15 mm. long, divided to below the middle into short ovate to triangular-ovate lobes that are soon extended as linear-lanceolate to subspatulate lobules, usually invested with a dense covering of long white paleaceous hairs, sometimes bilabiate or irregular; corolla rotate-pentagonal to rotate-stellate, 3–4 cm. in diameter, spreading-reflexed; anthers oblong-lanceolate in outline, 5–7 mm. long, usually dorsally minutely trilobulate at the base; filaments broad, glabrous, about 1 mm. long; style 7–11 mm. long, glabrous or sometimes minutely cellular-papillose below the middle, the stigma slender-clavellate to globose; fruit (immature) oval to subglobose, 1 cm. or more in diameter.

Solanum tacnaense is a high mountain species that occurs between 2,200 and 3,200 meters altitude and flowers from February to April. It is closely allied to *S. Weberbaueri* of the southern coastal region of Peru and to *S. medians* to the north. (cf. discussion under *S. Weberbaueri*.)

Moquegua: Carumas, open mixed formation, 2,600 m. alt., *Weberbauer 7276*.—Tacna: Prov. Tacna, near Minas de Toquepala, a few kilometers before reaching the Radio Station of the mine, 3,140 m. alt., *Ochoa 2046*. Open formation, herbs, shrubs and *Cereus*, Candarave, 2,900–3,000 m., *Weberbauer 7379*.

Solanum tacnaense f. **decurrentialatum** (Ochoa) Corr., Wrightia 2: 197. 1961. *S. Weberbaueri* var. *decurrentialatum* Ochoa, Agronomía (Lima) 26: 219, Figs. 1959. Type: Peru, Dept. Tacna, Prov. Tarata, rocky hills near Tarata, Cerro Ticalaco, 3,200 m. alt., March 22, 1953, *C. Ochoa 2040*. *Figure 79*.

In originally describing this plant, Ochoa placed it as a variety of *S. Weberbaueri*, a plant that occurs in the coastal loma vegetation

FIG. 79. *Solanum tacnaense* Ochoa. 1, flowering plant, × ½; 2, calyx, spread out, × 1½; 3, calyx (abnormal), spread out, × 1½; 4, corolla, spread out, × 1½; 5, stamen, dorsal view, × 3; 6, pistil, × 3; 7, leaf, to show maximum size, × ½. *Solanum tacnaense* f. *decurrentialatum* (Ochoa) Corr. 8, two leaves, about × 2/5.

of Peru and flowers from July to November. The present plant occurs at 3,200 m. alt., and flowers in March. In addition to these altitudinal and seasonal differences, the broadly decurrent, uppermost pair of lateral leaflets are quite distinctive. Some plants, however, of *S. Weberbaueri* do show a weak tendency toward this latter characteristic, especially in the plant described as *S. Weberbaueri* var. *poscoanum*.

Forma *decurrentialatum* approaches var. *Sandemanii*, but the differently shaped, subsessile terminal leaflet and more closely placed, somewhat broader and more strongly decurrent lateral leaflets set it apart.

Solanum tacnaense var. **Sandemanii** (Hawkes) Corr., Wrightia 2: 196. 1961. *S. Sandemanii* Hawkes, Ann. and Mag. Nat. Hist., ser. 12, 7: 709, Figs. 12–13. 1954.

Variety *Sandemanii* differs from typical *S. tacnaense* in having narrower tapering leaflets with the upper lateral pair conspicuously narrowly long-decurrent on the leaf-rachis. Also the calyx-lobes tend to be more constricted with the apical portion much narrower.

Arequipa: southern slopes of Chachani Mountain north of Arequipa, ravines, 2,500 m. alt., *Hinkley 46*. Chihuata, 3,000–3,100 m. alt., *Ochoa 2034*. Rock ledges along draw above Arequipa, 2,600–2,700 m. alt., *Pennell 13196*. Arequipa, *Petersen & Hjerting 1108*. Baños de Jesús, 2,900 m. alt., *Sandeman 3812*. Prov. Arequipa, rocky area, Jesús to Chiguata, 2,900–3,100 m. alt., *Vargas C. 8086*. —Ayacucho: among boulders and rubble on west slope of Andes about 45 km. from Nazca on road to Puquío, 2,200 m. alt., *Correll & Smith P148*.

Solanum Weberbaueri Bitt., Repert. Sp. Nov. 11: 365. 1912. *S. medians* Bitt. var. *majorifrons* Bitt., Repert. Sp. Nov. 12: 149. 1913. *S. medians* var. *majorifrons* subvar. *protohypoleucum* Bitt., Repert. Sp. Nov. 12: 150. 1913. *S. Weberbaueri* var. *poscoanum* Cárd. & Hawkes, Jour. Linn. Soc., Bot. 53: 101, Fig. 7. 1946. *Figure 80*.

Among rocks in sandy-stony soil of the loma region of coastal southern Peru, 500–900 m. alt.

Plant up to 7.5 dm. or more tall, more or less pilose throughout, probably tuber-bearing; tubers unknown but doubtlessly produced; stem angular, rather stout; leaves odd-pinnate, up to 17 cm. long, with or without a few interstitial leaflets, coarsely and sparsely pilose

FIG. 80. *Solanum Weberbaueri* Bitt. 1, upper and lower (in background) parts of flowering plant, × ½; 2, calyx, spread out, × 1½; 3, corolla, spread out, × 1½; 4, stamen, dorsal view, × 3; 5, pistil, × 3.

on the upper surface, more finely and densely pilose on the lower surface; leaflets 5 or 7, rarely 9, elliptic to broadly lanceolate or elliptic-lanceolate, broadly obtuse to somewhat abruptly acute or acuminate at apex, the margins lightly denticulate; terminal leaflet tapering at base, up to 10 cm. long and 6.5 cm. wide, sometimes only slightly larger than the adjacent lateral pair; lateral leaflets sessile and oblique at base, more or less decurrent on the rachis (especially the uppermost pair), up to 8.5 cm. long and 4 cm. wide; pseudostipular leaves broadly lunate to semi-orbicular, falcate, up to 2 cm. long; inflorescence pseudoterminal, cymosely paniculate, up to 20-flowered, often with scattered small bracts; peduncle 3.5–8 cm. long, rather long-pilose; pedicels slender, 1.5–3 cm. long, prominently articulate at about or above the middle or sometimes within 3 mm. of the calyx, gradually dilated into the calyx, long-pilose; flowers violet-color, showy; calyx 5–11 mm. long, divided well below the middle into ovate-lanceolate to lanceolate acuminate-tapering lobes, often bilabiate, invested with long whitish hairs, corolla 2.5–3.5 (rarely up to 4 or more) cm. in diameter, broadly rotate-substellate to rotate-pentagonal, the acumens often prominent; anthers 5–7 mm. long, oblong-lanceolate in outline, commonly dorsally trilobulate at the base; filaments 1–2.5 mm. long, glabrous; style 8–12 mm. long, typically glabrous, the stigma clavate to clavellate; fruit unknown.

The plants described as *S. Weberbaueri, S. medians, S. neoweberbaueri, S. tacnaense* and *S. Sandemanii* unquestionably represent "specific" separations of degrees rather than by lines of demarcation. The first three, with the exception of *S. medians* var. *autumnale*, are found at elevations below 1,000 meters in the loma vegetation formation along the coast of Peru from July to November. Variety *autumnale* occurs in the mountains between 1,800 and 4,000 meters altitude in Lima Dept., Peru, and flowers in March and April. The last two, *S. tacnaense* and *S. Sandemanii* (*S. tacnaense* var. *Sandemanii*) are found in Peru mainly in the departments of Tacna and Arequipa, where they occur from 2,200 to 3,200 meters altitude and flower from February to April.

Arequipa: Prov. Camaná, Lomas de Camaná, Km. 3–4, sandy hills 500–600 m. alt., *Ferreyra 8835*. Posco, 650 m. alt., *Guenther & Buchtien 98*. Cachendo, 900 m. alt., *Guenther & Buchtien 98a*. Prov. Islai, "lomas de Posco," 600–900 m. alt., stony sandy soil, *Vargas C. 2019*. Tambo de Visa, *Martinet 232*. Prov. Mollendo, Tambo, 500–600 m. alt., among rocks in loma formation, *Weberbauer 1575*.—Indefinite: "Hab. in Collibus Chancay," 1778–1788, *Ruiz & Pavon 8/90 p.p.* (cf. *S. immite*).